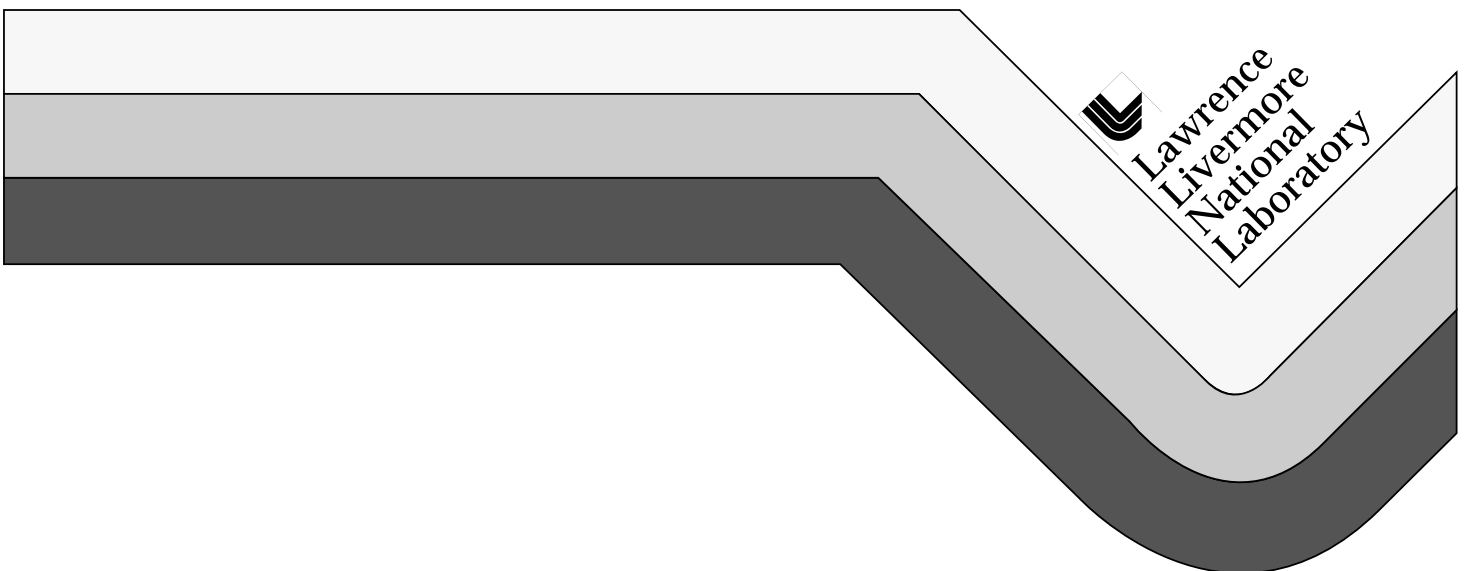


The Lawrence Livermore National Laboratory's ES&H Compliance Assessment Process

L. Lynn Cleland

January 1997



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Executive Summary

The Laboratory evaluates its environment, safety and health (ES&H) Program and conducts comprehensive ES&H “compliance” assessments where compliance is defined as adherence to Laboratory ES&H policies. This document describes the Laboratory’s seven level assessment process, from the contractual level to the individual employee level. Although ES&H Program evaluation is important, it is not part of this document.

The Laboratory’s overall philosophy for conducting its assessment process has an underlying objective: to simultaneously have an effective and efficient process. This requires avoiding duplicative assessments, limiting formality, clearly defining responsibilities and using appropriately trained staff.

Employees operations, activities and facilities are comprehensively assessed, both formally and informally, by Laboratory management, by numerous sets of people including Laboratory ES&H Discipline and ES&H Team staff, and by the Department of Energy (DOE) and external regulators. As expected and desired, the frequency of assessments is highest at the lower end of the hierarchy and types of assessments and experience of assessors varies by level. For example:

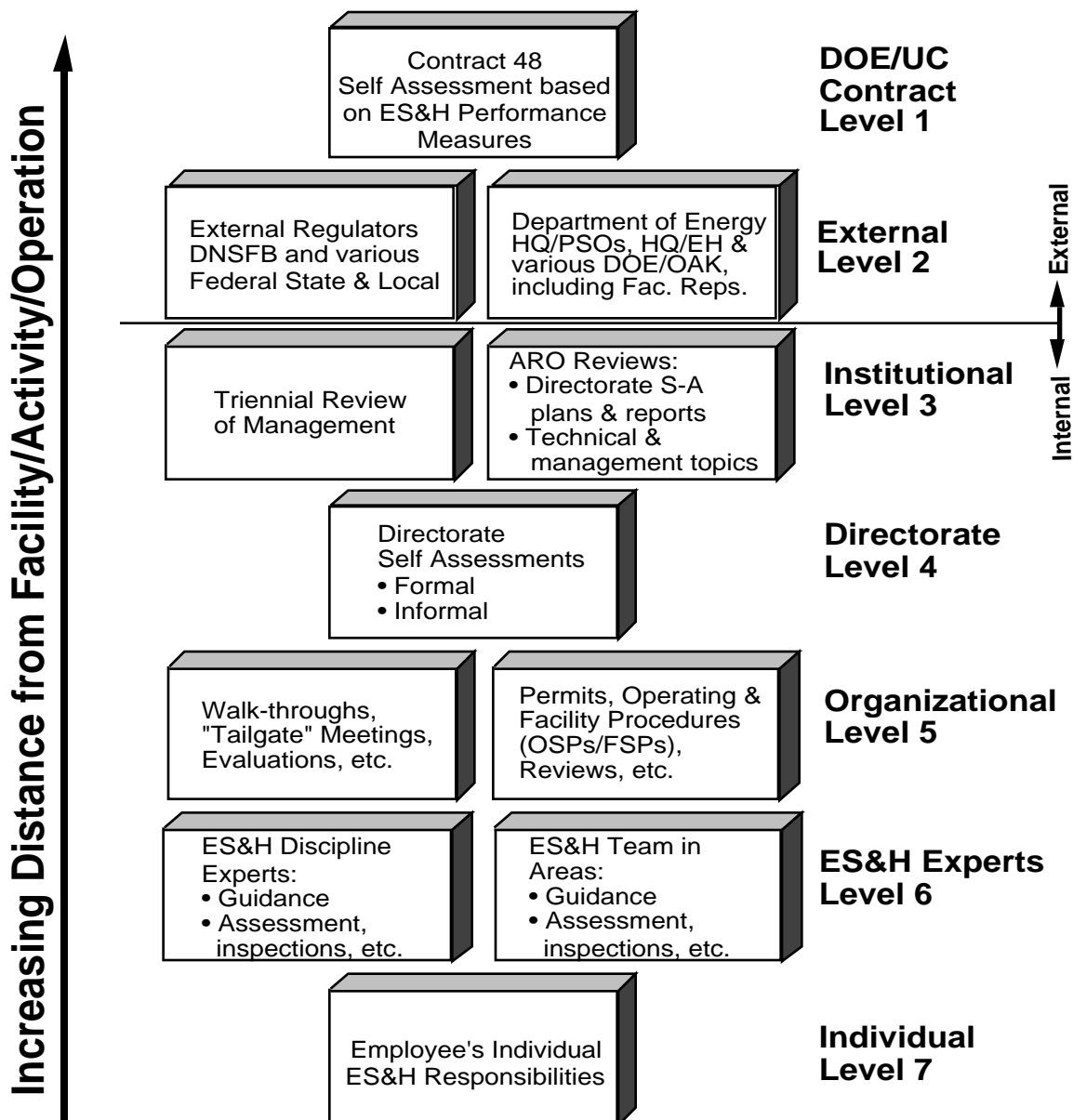
- The ES&H Team and Discipline staffs frequently assess work areas through their Action Plan "tasks" and their daily support of the line staff.
- Organizational management and staff meet Laboratory ES&H policies and procedures by developing/reviewing operating and facility safety procedures and by participating in formal and perhaps informal assessments.
- Directorate staff conduct a formal assessment and do informal ones. The associate director must sign off on the annual report for the formal assessment.
- The Director’s Office provides assurance checks through the commissioning of a Triennial Review and through selected Assurance Review Office (ARO) assessments.

The hierarchical process described herein is both effective and efficient. It couples well to the Principles and Functions of the DOE’s Integrated Safety Management (ISM) initiative.

I. Introduction

This document describes the Laboratory's comprehensive ES&H "compliance" assessment process, from the contractual level to the individual employee level, where ES&H compliance is defined as adherence to Laboratory ES&H policies. Most of these policies are listed in References 1, 2 & 3. The Laboratory ES&H assessment process consists of a hierarchy of overlapping self assessment processes and steps shown in Figure 1. The intent of this process is to determine if Laboratory operations, facilities and activities are in compliance with Laboratory policies.

Figure 1: ES&H Assessment Hierarchy



The primary purposes for this document are twofold: 1) to document the Laboratory's compliance assessment process for Laboratory, DOE and other staff and managers and 2) to demonstrate the type of assessments conducted, their level of detail and the completeness and quality of the process.

A well developed self assessment process is important to the Laboratory since it should improve ES&H performance and enhance customer (DOE) and stakeholder confidence that the Laboratory is adequately protecting employees, the public and the environment. A well managed process should also be cost-effective.

Self assessment is an essential element of the new DOE ISM initiative. As indicated in Appendix A, the ISM objective is to "Do work safely." This objective is guided by seven key "Principles" and the system consists of five basic "Functions." While many parts of the system should be self assessed, one Function, Feedback/Improvement, is dependent upon an effective self assessment process.

The new DOE Oversight initiative utilizes self assessment as a key source of information for conducting the oversight evaluation. The information from an effective self assessment process should meet DOE's requirements for oversight and should result in savings for both the Laboratory and DOE.

Section II below briefly describes the Laboratory's philosophy for compliance assessments. Starting in this section and throughout this document, the terms "assessment" or "assessed" are used to include "self assessment," and individual "inspections" and "evaluations" as well as sets of them. Section III describes the general nature of the assessment levels in the hierarchy and lists key questions that are considered at each level to determine completeness and quality of the process. Many of these questions can be directly linked to the ISM concepts summarized in Appendix A. At each level of the hierarchy these questions address scope and intent; roles and competencies of staff; and criteria, plans, actions and documentation. Section IV provides a description of the activities and purpose of assessments at each level and brief answers to the questions for each level. Appendix B contains more detail descriptions and answers. Section V is a brief summary.

While reading this document, keep in mind that the focus is on the Laboratory's compliance self assessment process. Many of the assessments at different levels (Figure 1) are further interlinked by management processes, e.g. ES&H Program reviews and committee activities. Although important, these interlinked management processes and how the quality and effectiveness of the Laboratory's ES&H Program is evaluated are not part of this document. The ES&H Program and many of the management processes are contained in Reference 1: The Environment, Safety, and Health Program at the Lawrence Livermore National Laboratory. Compliance assessment and

program evaluations require different approaches. Differences between compliance assessment and program evaluation are shown in Table 1.

Table 1: Self Assessment vs. Program Evaluation

	Self Assessment (S-A)	Program Evaluation	Comments
<u>Assessment Objectives</u>	Assess compliance of operations, facilities, & activities with ES&H policies aimed at protecting people and the environment	Evaluate programs, goals, operations, activities and facilities for adequacy, effectiveness and quality.	Different activities are required for executing S-As and program evaluations.
<u>Scope</u>	Assess to documented ES&H requirements (e.g., policies and procedures) and BMPs	Evaluate organization, structure, costs, quality of service, documentation, responsiveness and performance including ES&H results.	S-A is only one “tool” for managers to use. Managing <u>only</u> by using S-A would not work.
<u>Formality of Processes</u>	<p>Formal evaluation processes are <u>simple</u> and <u>structured</u>. They generally require use of technical specialists and/or special training</p> <p><u>Informal</u> processes are similar to formal processes, but less structured. They are <u>not essential</u>.</p>	<p>Formal evaluation processes and techniques take <u>multiple forms</u>, e.g.: technical and management (sr. mgt., ES&H WG, line mgt.) peer reviews; customer, program and design reviews; QA, S-A, regulatory, oversight (UC & DOE), and Institutional evaluations.</p> <p>Continuous <u>informal</u> application of management principles are <u>essential</u> to day-to-day operations.</p>	<p>Mgt. review & evaluation is <u>for</u> the <u>managers</u> and line supervisors.</p> <p>In the “real world” both are dominated by the “bottom line.”</p>
<u>Timeliness</u>	Assessments are periodic, a “snapshot in time,” whether done informally or formally	Formal program evaluations are also periodic. Informal evaluation is continuous.	

II. Compliance Assessment Philosophy

The Laboratory has established an overall philosophy for conducting its assessment process. **The objective is to have an effective and efficient process.** To achieve this objective:

Information Use: All available information is used to conduct the assessment process. Duplicating assessments, audits or evaluations done by qualified persons or groups, from inside or outside of the Laboratory, are avoided. Since the nature of the assessments, i.e., the number and type, varies from the bottom to the top of the hierarchy, the result is a very comprehensive, effective and efficient assessment process.

Formality: A graded approach is used to provide flexibility in meeting organizational needs. Given the diversity of the Laboratory's operations, activities and facilities, considerable flexibility is required to meet the effectiveness and efficiency objective. Criteria are provided for formal assessments at the directorate level (Level 4). These criteria are indicated in Reference 2: *Health and Safety Manual, Supplement 2.04*. Assessment formality at this level helps to ensure assessments are done across the Laboratory and that these assessments have a common basis by which to make cross-directorate comparisons. Assessments at other levels may be less formal, but it is worth noting that at some levels there is considerable uniformity across the Laboratory. For example, ES&H Disciplines and ES&H Teams (Level 6) assessments apply common criteria and practices across all of the Laboratory's directorates.

Assessment check lists are not required for any of the assessment processes. This is consistent with practices of regulatory agencies. However, an Assessments, Inspections and Reviews (AIRs) list is part of Reference 2, Supplement 2.04. This list is reviewed annually by the ES&H Working Group and is intended as a reminder of the topical areas that should be addressed by each directorate. It is not intended to be all inclusive or to represent all technical elements of a particular topic.

A computerized system, DefTrack, is a management and staff aid unique to the Laboratory that is used to track the results from formal assessments including those conducted by outside agencies. This computer program contains over 300 "Codes" that allow findings to be placed into categories, thereby facilitating trending of information. See Reference 4 for a complete list of Codes and Appendix C for a few examples. These Codes represent a "short list" of criteria (requirements) that managers and scientific and engineering staff have available to help them conduct assessments of ES&H issues. The DefTrack Code list is intentionally kept modest in size to facilitate its use, i.e., something that a manager or staff person can review for use as needed. The DefTrack Code list is not intended as a comprehensive "check

list", and our trained ES&H staff rely upon their education and experience to assess all applicable criteria and requirements.

Note: To facilitate trending of the data, Codes are listed by ES&H topic; however, many Codes apply to several topics but are listed only under one topic, e.g., "exit door blocked" may apply to industrial, fire and seismic safety.

Responsibilities: Assessment responsibilities are assigned to the line organizations responsible for the operations, activities and/or facilities. However, line organizations typically "contract" with ES&H support organizations to obtain the required ES&H technical expertise. The ES&H support organizations are responsible to assure their staff are knowledgeable of the Laboratory's ES&H policy requirements. In some cases disciplines representing the Institution may act for the line organizations. A typical example is the fact that the Emergency Response Division of the Hazards Control Department uses its firefighters to conduct periodic checks of fire extinguishers and uses its fire safety engineers to routinely inspect fire safety water systems.

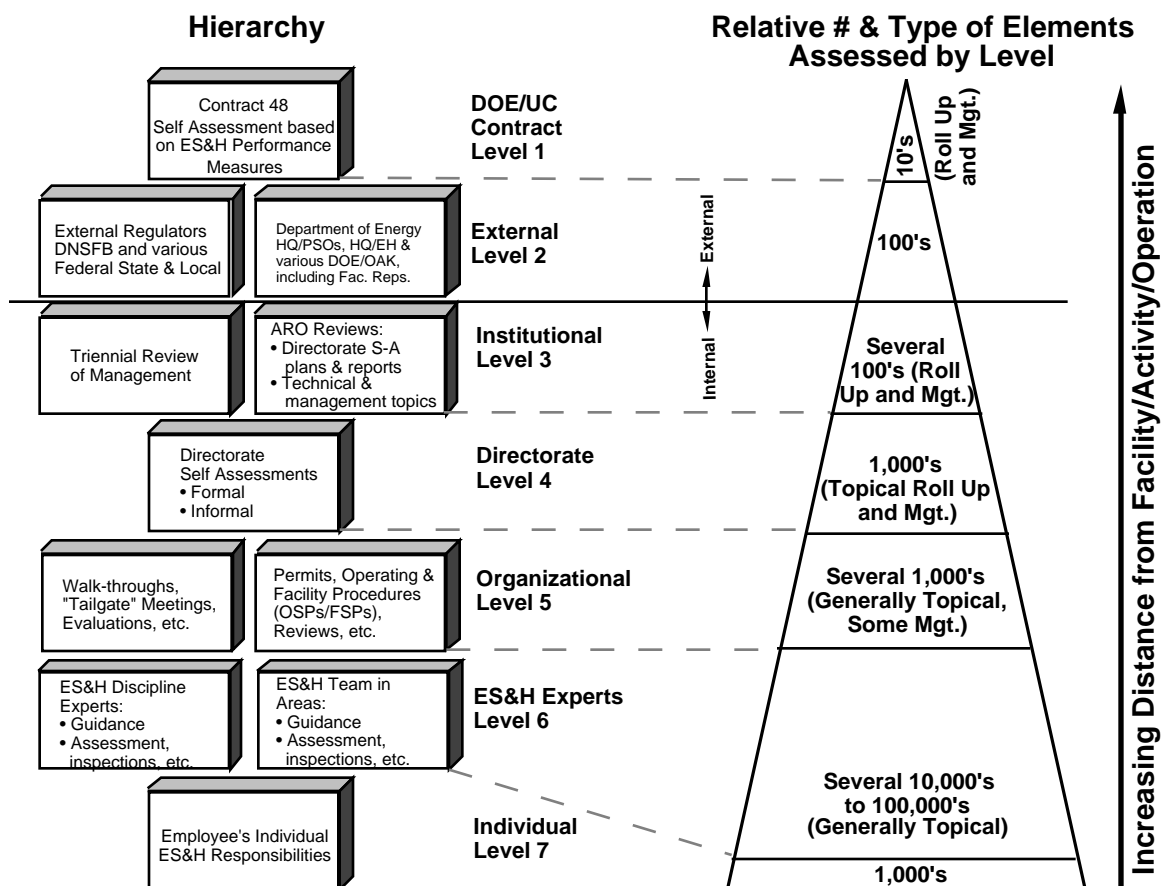
Qualifications: Appropriate training and experience is required for conducting the assessments at each level. Every (line) associate director has an assurance manager and other staff with some ES&H training. These line staff conduct some assessments within their organizations. However, the technical nature of ES&H policy requirements necessitate the use of well trained staff to conduct many of the assessments; thus, line management typically uses professionals and technicians from the Laboratory's ES&H organizations to assist with their assessments. Occasionally outside ES&H professionals are contracted for special assessments, e.g., the Director's Triennial evaluation.

Documentation: A graded documentation approach commensurate with the type of the assessment is encouraged at all assessment levels. For informal assessments minimal documentation and positive ES&H results are more important than are detailed documentation. Deficiencies required to be listed in DefTrack are the primary source of data for tracking and trending of important deficiencies that need to be broadly reported. Formal documentation requirements are specified in Reference 2, Supplement 2.04.

III. Assessment Hierarchy and Integrated Safety Management

As depicted in Figure 2, the number of elements assessed per year at each level of the hierarchy is largest at the lower levels and smallest at the upper levels. Those managing or working in a facility, operation or activity, if qualified, have the best and most timely knowledge of ES&H issues and are in the best position to assess ES&H elements on a routine basis. Assessments at higher levels are broader in scope to include management processes as well as the information from and quality of lower level assessments. Thus the hierarchy provides a comprehensive compliance assessment process.

Figure 2: ES&H Hierarchy and Number/Type of Elements Assessed



The assessment hierarchy couples very well to many elements of the new DOE ISM initiative. The obvious coupling is to the Feedback/Improvement Function (see Appendix A). The process does, however, impact all of the safety functions and, as described in the questions below, addresses many of the Principles of the ISM.

At each hierarchy level, several questions have been addressed to assure the completeness and quality of the assessment process. These questions and how they link to the ISM are presented below.

Question 1: What are the scope, intent and expected results of the assessment at this level? This is carrying out the ISM Function, Define Scope of Work, i.e., plan the work, set expectations and set priorities for conducting the assessment.

Question 2: Are line managers or staff involved at this level? This addresses ISM Principle 1, Line Management Responsibility for Safety.

Question 3: Are roles, responsibilities and authorities clear? This addresses ISM Principle 2, Clear Roles and Responsibilities.

Question 4: Are there criteria, bases and/or requirements for the assessment activity? ISM Principles 4, 5, and 6, and/or best management practices (BMPs) are addressed by this question, i.e., balance priorities, identify requirements and tailor them to the work.

Question 5: Are plans needed to conduct the assessment at this level? The Executive Summary in Appendix A suggests focusing on results.

Question 6: Are the assessors competent to do the intended assessment? This is addressed in Principle 3, Competence Commensurate with Responsibilities.

Question 7: What are the actual versus expected/planned assessment activities? This addresses performance of the work, i.e., the ISM Function, Perform Work.

Question 8: Are the findings/observations being reviewed and acted upon? This is directly related to the ISM Function, Feedback/Improvement.

Question 9: Are the results documented? Although this question is related to Question 8, some minimum level of documentation may be required in order to effectively answer other questions and to provide verification to upper management and customers (e.g., DOE) that the assessment was conducted.

IV. Assessment by Hierarchical Level, from the Bottom Up

Discussion of the hierarchy starts at the bottom since higher levels of the hierarchy frequently represent a “roll-up” from below. Some levels are relatively standard across the Laboratory, e.g., Levels 1, 4 and 6, while others are driven by the work, e.g., Levels 2 and 7. Levels 3 and 5 are a mixture.

Note: Assessment Level 1 evolved as a result of the present Contract 48. More enhanced external regulation (Level 2) began in the late 1980's. Levels 3 and 4 were expanded and formalized as a result of DOE's Tiger Team findings, but had been ongoing. Levels 5, 6 and 7 have been practiced since shortly after the Laboratory was formed but have evolved over time.

Background information, descriptions of the assessment activities and the purposes of these activities are briefly provided below. To give a sense of the magnitude of the activity, (conservatively low) numbers are presented where feasible. The numbers represent only the regular assessments and do not reflect daily operations.

Level 7: Individual

Each person has ES&H responsibilities and their ES&H performance is formally evaluated as part of their annual performance review. These are described in Reference 1. However, regular broad assessment of ES&H compliance, other than conformance to general policies, is not part of most employees job assignment.

Nevertheless, each person (1) is expected to be aware of general Laboratory ES&H policies and procedures, (2) has the authority to stop unsafe work and (3) must be sufficiently knowledgeable that he or she can protect him- or herself, coworkers, the public and the environment. Training is required of each new employee to provide this base knowledge. Additional training is provided as required by the discipline and/or assignment. For example, mandatory training is specified in Reference 5: LLNL Training Program Manual, and in various Facility and Operations Safety Procedures (e.g., FSPs, OSPs & SARs).

Individual employees, working with their supervisors, are expected to assess their compliance with training, documented requirements and common sense safe work practices on a routine basis. If they have concerns or questions they are expected to obtain answers from their supervision or ES&H experts. These individual assessments are aimed at both developing a good ES&H culture and protecting the worker, their fellow employees, the public and the environment. Good results at higher levels of the hierarchy are possible only if individual ES&H performance is good.

Level 6: ES&H Experts

ES&H Teams are assigned to support specific directorates, programs, locations and/or activities. These teams develop ES&H Team Action Plans (TAPs) that are tailored to the hazards present for facilities and operations. These TAPs specify the conducting of numerous assessments in the work areas where the assessment frequency may be hazard level dependent. The Plans generally span the set of all applicable ES&H topics.

The ES&H Team Leaders develop the TAPs based on an analysis of Discipline Action Plans (DAPs). DAPs are developed by all the discipline members supporting the Team. The TAP is a collection of applicable routine ES&H assessment services the Team is to deliver to a program area. Examples of these duties include scheduled ventilation system surveys, surface swipes for radiation contamination, planned walk-throughs and inspections of facilities etc. Discipline members typically review and initial the log book of the Teams to confirm that these routine duties are being performed. The list of topics and the suggested frequency of assessments is contained in the Reference 6: Hazards Control Manual, Section 3.04, Discipline Action Plans/Team Action Plans.

Other discipline experts from the ES&H Organizations also participate in a variety of assessment activities. Some of these activities are specified in the DAPs and others are contained in separate documents. Some of these assessment activities are performed for the Institution, e.g., fire extinguishers checks, confined space audits, and compliance with 10 CFR 835. Other assessment activities are performed by the ES&H Team safety discipline experts for the specific work areas that they support. These discipline experts are also frequently called upon by line staff and managers to provide guidance for unusual situations or concerns.

As an example, the list of ES&H TAP topics addressed by Team 4 for Plant Operations is shown in Appendix D. Similar TAPs are developed for each directorate. Team members take extensive training in a broad cross section of ES&H disciplines. The set of training courses required for Teams and the qualifications of Team 4 members are shown in Appendix E. Thus, the well trained and work area knowledgeable Team members conduct the bulk of the lower levels assessments. Team members are also expected to contact the appropriate environment, safety or health professional when an issue arises that is outside their training or experience.

The list of safety Discipline self assessment activities is provided in Appendix F. The Laboratory's ES&H discipline professionals generally have one or more advanced degrees in one or more ES&H disciplines. Most are certified

in their profession and have many years of experience. Many participate in national standards setting activities.

The Team and Discipline assessment processes are intended to prevent problems and, should they arise, to find them early so that they can be corrected at the lowest possible level. Each Team and Discipline member is expected to work ES&H issues at the lowest reasonable level in the line organization. Thus, immediate corrective action by local line staff and the Team member is the norm. This provides defacto OJT training to the line staff.

The purpose of the assessment at this level is to control and reduce ES&H incidents using the most knowledgeable staff locally available. These experts have dual roles: to provide technical support to their customers and to assure ES&H activities are properly carried out (see Reference 1).

Note: The assessments done at this level are viewed as very cost effective because they are done by well trained staff that live in or frequent the work areas on a daily basis.

There are about 10,000 people on site, approximately 500 facilities total at Livermore and Site 300, and hundreds of ongoing operations. Most of the assessments described in Appendices D and F occur one or more times per year. The result is an estimated 100,000 to 200,000 specific assessments conducted annually by the four ES&H Teams and ES&H Discipline professionals. These specific assessments span the set of all ES&H topical elements.

Level 5: Organizational

At this level there are formal and informal assessments. Organizations in each directorate participate in the formal assessment process defined in Reference 2, Supplement 2.04. Also, important to the ES&H assessment process are the reviews required by Laboratory policies and best management practices. Laboratory policies require adherence to the requirements specified in References 2 & 3 and with guidance from ES&H professionals (when new or undocumented guidance is required). Examples of formal reviews include hazards analyses, OSPs, FSPs, SARs, readiness reviews and design reviews. Protocol and criteria are documented for these formal activities.

Most of these documents are reviewed periodically by policy. For example, OSP/FSP training requirements are to be reviewed prior to an employee beginning work, OSPs are reviewed at least once per year, FSPs are reviewed at least every three years. In each case ES&H experts are a part of the process

and in most cases the protocol requires their signature in addition to that of the responsible line person.

The purpose of these formal assessments is to assure the four ISM functions, Define Scope of Work, Analyze the Hazards, Develop/Implement (Hazard) Controls and Perform Work (see Appendix A) are properly planned and implemented particularly for higher hazard/risk activities.

There are about 175 FSPs and 400 OSPs for Laboratory facilities and operations. The number of design reviews, etc. are not easily determined.

Most organizations conduct informal assessments, depending upon the hazards involved, the detail of their formal self assessment and other factors. These assessments range from daily walk-throughs or regular “tailgate meetings”, to detailed “check lists” of specific functions, for example, waste accumulation areas. Organizational evaluations are wide-ranging.

The purpose of informal assessments is to foster positive ES&H culture in addition to ensuring the Laboratory’s ES&H policies are being appropriately implemented. These assessments are generally initiated by management but may be run by staff and, in some cases, are initiated by the staff. For example, an excellent safety process has been developed among crafts persons.

Quantifying the number of informal activities that take place around the Laboratory would be very difficult. However, the numbers may be quite large. For example, annually approximately 40,000 small construction tasks (Whiz Tags) are executed at the Laboratory. These are given descriptive titles which are put on a computer for review by ES&H experts. By perusing the titles potential ES&H problems that may be suggested are further evaluated before the work is done. If a problem is overlooked it would be found by the line staff, managers, Team or Discipline staff, but the goal of the process is to catch issues before they become a problem while still efficiently handling the Whiz Tag volume.

Level 4: Directorate

All assessments at and below this level (i.e., Levels 5, 6 & 7) are the responsibility of the directorate, i.e., the responsible associate director. The formal assessments and typically some informal assessments are managed at the directorate office. The minimum assessment criteria is specified in Reference 2, Supplement 2.04. However, assessments well beyond Supplement 2.04 are expected and are carried out by each directorate through their support and involvement at the lower levels. The formal requirements include but are not limited to:

- Directorate level (Level 4) formal assessment plan development and implementation. While this formal assessment is managed by the directorate office, all directorate organizations participate in its execution.
- Directorate formal assessment annual report development that includes review and assessment of tracked deficiency data.
- Other activities as specified by the responsible Associate Director and Laboratory policy, e.g., the Assurance Manager that reports to the responsible Associate Director may carry out other assessments.

The purpose of the formal process is to conduct and review assessments across the directorate. These assessments are tailored to the unique directorate modes of operation and hazards. The assessments are expected to be sufficiently complete to insure Laboratory policies are met for the entire directorate.

The objectives of the Laboratory's formal ES&H self-assessment program are to:

- Involve all levels of management in regularly reviewing the organizational structures, operational activities, facilities, and infrastructures under their direction to help ensure ES&H compliance and conformance with LLNL policies and procedures.
- Develop a proactive approach to ES&H management as an integrated component of total program management.
- Ensure the timely identification and correction of deficiencies.
- Minimize the occurrence and reoccurrence of deficiencies.

Informal assessments take place at the directorate office or lower levels depending upon the structure of the directorate. These informal assessments are not required to be part of the formal plan or report but some of these activities may and often are included in the formal report. These informal assessments, nevertheless, are part of the overall assessment process.

Level 3: Institutional

The ARO, reporting to the Deputy Director for Operations, is the primary Institutional evaluation and assessment organization for the Laboratory. The roles, responsibilities and authorities of the ARO are specified in Reference 1. Among other things the ARO assesses:

- Directorate level (Level 4) formal assessment plans and annual reports to determine conformance to the policies as specified in Reference 2.
- Management and ES&H topics. ARO does selected vertical and/or horizontal “slice” assessments of management and ES&H topics. Topics are selected based on trending information, e.g., DefTrack data, observations, external findings and other sources.

The purpose of ARO assessments is to assess both balance and conformance to policies across the Laboratory taking into account unique directorate modes of operation and hazards.

The Director triennially initiates the review of the Laboratory’s ES&H self assessment management system. This review is conducted by experienced managers from private and/or federally funded organizations. It is the highest level of Laboratory management assessment.

The purpose of the triennial review is to obtain an independent review of the Laboratory’s self assessment program. Although compliance is the ultimate goal, this assessment is focused on management rather than compliance details.

Level 2: External

External regulators have become an ever increasing part of the whole assessment process. They have been heavily involved in environmental areas since the 1980’s. More recently the DNFSB staff have become active assessors of our nuclear activities.

The purpose of external regulatory assessments is to evaluate the Laboratory’s compliance to regulatory standards and requirements.

DOE assessments include those conducted by HQ/PSOs, HQ/EH Office, various OAK programs and ES&H offices, and facility representative staff.

The purpose of DOE assessments is to evaluate the Laboratory’s compliance to DOE standards and requirements. DOE assessors have historically used DOE Directives, Manuals and Guides as the basic criteria since, in general, the criteria in these documents exceed national consensus standards. Some recent assessments have used LLNL implementation plan criteria to conduct assessments.

Level 1: UC/DOE Contract

At the highest level, the DOE/UC Contract contains Performance Objectives, Criteria and Measures (POCMs) as Appendix F of Contract 48 (see Reference 7). These have been mutually developed by DOE/OAK, UC, LBNL and LLNL. Similar POCMs have been developed by DOE/AL and LANL. By agreement, these are to be indicators of ES&H performance and are not all inclusive. The Performance Measures (PMs) are assessed each year by LLNL and are reviewed and “graded” by UC and then by DOE. By definition this is an assessment process where the PMs are evaluated annually. The Laboratory’s line ES&H Assurance Managers coordinate the Laboratory’s information and response to the PMs. The majority of the PMs actually measure performance of line activities verses measuring an ES&H function such as health physics.

The purpose of Appendix F and the POCMs is to assess LLNL’s performance and to encourage improvement through the use of a select few performance measures (PMs). There are presently approximately twenty PMs in the Contract (see Reference 8).

Answers to the Nine Questions

Discussion of the hierarchy would not be complete without a discussion of how well the various levels link to each other and how well each level addresses the nine key questions listed in Section III.

Assessments at the different levels should be complementary, not duplicative. To meet the effectiveness and efficiency objective, there should be some overlap from one level to another, but not much. Each level should have a slightly different focus, e.g., individual practices, technical requirements, management of requirements, oversight of requirements, etc. Some higher level oversight assessments may need to include a review of all lower levels.

Completeness or comprehensiveness, frequency and formality of assessments are a management judgment decision. Comprehensiveness and frequency should vary depending upon the risks being assessed and the intent of the assessment process. Formality may be necessary to assure validity of the process and to foster appropriate cultures. If indicators, such as poor safety or regulatory statistics or poor assessment results, suggest general ES&H problems, then increasing comprehensiveness, frequency and/or formality may be an appropriate way to improve the culture and ultimately the results.

Finally, brief answers to the nine questions for each level are presented on the following pages. For more detailed descriptions and answers to these questions see Appendix B.

TABLE 2: Summary Answers by Level to Nine Key Questions

	Level 1: Contract	Level 2: Regulator/DOE	Level 3: Institutional	Level 4: Directorate
Q1: What are the scope, intent and expected results of the assessment at this level?	The Contract includes a select few integrated measures mutually agreed upon by DOE/UC /Lab. The intent is to use these measures to monitor general performance. Improvements in selected areas is expected.	Scopes of regulatory and DOE assessment vary based on a variety of factors. The intent is to evaluate the Laboratory's overall compliance to regulatory and DOE standards and requirements. Full compliance is expected.	Based on a variety of internal and external indicators, e.g., data, lessons learned, etc, the ARO uses vertical and horizontal "slices" to assess selected topics. The intent is to conduct and review assessments across the Lab and to evaluate the Lab's assessment program. It is expected these assessments provide adequate institutional oversight.	Directorate Office staff formally assess implementation of relevant ES&H policies across the entire directorate. Documented criteria are followed. The intent is to assess and review activities across the entire directorate, taking into account the unique directorate operations and hazards. Meeting the documented criteria is expected.
Q2: Are line managers or staff involved at this level?	Line assurance managers coordinate the Lab information and responses.	Both line managers and ES&H experts are involved.	Activities report to the Director's office and line assurance managers are the source of inputs.	The assurance manager reporting to the associate director leads the activity.
Q3: Are roles, responsibilities and authorities clear?	Responsibilities jointly agreed to by DOE and UC are documented. (See Ref. 7)	N/A	Responsibilities are documented or are part of the contract for outside experts. (See Ref. 1)	Responsibilities are documented in Refs. 1 & 2, Supp. 2.04. Others may be specified by the associate director.
Q4: Are there criteria, basis and/or requirements for the assessment activity?	General requirements are agreed to by DOE and UC. Criteria for specific performance objectives are part of the Contract.	Criteria are dictated by statutes and related documentation.	Criteria are specified in numerous sources including Laboratory documents and DOE directives.	Minimum criteria are specified in Ref. 2, Supp. 204.

Summary Answers by Level to Nine Key Questions

Level 5: Organizations	Level 6: Teams & Disciplines	Level 7: Individual
Management and staff formally and informally assess plans and implementation to ES&H policies, particularly for higher risk/hazard activities. The intent is to foster a positive ES&H culture and to evaluate policy and appropriate best management practices (BMPs) implementation.	ES&H team and discipline experts assess all relevant aspects of ES&H in the work areas. The intent is to control and reduce incidences by using the most knowledgeable individuals in the work areas to find problems early and help the line staff correct them. Experts are expected to provide ES&H support to the line.	Employees assess themselves and their work environment to be sure they are knowledgeable of general policies and procedures and the specific requirements for their assignment and work location. The intent is to perform work safely. Employees are expected to work safely and to stop work believed to be unsafe.
Line managers initiate the actions and fund ES&H experts that provide support and guidance.	Line managers fund the teams and disciplines and are responsible for corrective actions.	Line managers provide guidance and funds for training and oversee employee commitments.
Responsibilities are documented for specific requirements (See Refs. 1 & 2). BMPs are determined by the managers.	Responsibilities are documented (See Ref. 1). In addition to support, the ES&H experts are the ES&H “requirements gatekeepers.”	Individual responsibilities have been documented (See Ref. 1). ES&H is part of the performance appraisal process.
Specific criteria are indicated in Refs. 2 & 3. General policy criteria are specified in Refs. 1 & 2.	Criteria are documented in Ref. 6. Assessment frequency is established by the ES&H experts based on the hazards. Criteria covers the full scope of ES&H.	Criteria are specified in general policies and in the specific assignment related training.

Summary Answers by Level to Nine Key Questions

	Level 1: Contract	Level 2: Regulator/DOE	Level 3: Institutional	Level 4: Directorate
Q5: Are plans needed to conduct the assessment at this level?	Plans are agreed to by DOE, UC and the Lab.	N/A	The ARO develops an annual assessment plan. There is a plan for each assessment.	A formal assessment plan is required.
Q6: Are the assessors competent to do the intended assessment?	UC lead professional was a regional administrator of a CA. environmental regulatory agency.	N/A	Assessors are senior managers, technical ES&H staff and/or outside experts well trained and/or educated in specific ES&H disciplines.	Assessors are senior managers supported by Lab ES&H experts or outside experts.
Q7: What are the actual versus expected-planned assessment activities?	Performance results are assessed per the contractual requirements.	N/A	The ability to complete the planned assessments is the primary measure.	Expected formal assessment results are specified in Ref. 2, Supp. 204. These are reviewed by the ARO.
Q8: Are the findings/ observations being reviewed and acted upon?	Reviews by DOE and UC are required under the Contract.	Findings and observations that are provided to the Laboratory are acted upon by the line and entered into a tracking system.	This is part of the ARO process. Findings and observations are provided to the line for action and entered into a tracking system.	This is part of the formal reporting requirements. Specific findings are entered into a tracking system per policy.
Q9: Are the results documented?	Quarterly and annual assessment reports are documented.	Assessment results are documented by the regulator and/or DOE.	Assessment findings are documented for the appropriate directorate and institutional managers.	An annual report is required. The content of the report is described in Ref. 2, Supp. 204.

Summary Answers by Level to Nine Key Questions

Level 5: Organizations	Level 6: Teams & Disciplines	Level 7: Individual
Planned requirements are specified in Ref. 2. There are no planning requirements for BMPs.	Team and discipline action plans are developed for the Institution and work areas.	Specific plans are required for some assignments.
Varies by activity. Required assessments specify who is to participate including the ES&H experts needed for the process.	Team technicians have extensive broad ES&H training. Discipline experts have formal degrees and most are certified.	Each individual receives general training and specific training required for the assignment and/or work area.
Expected formal assessment results are specified by policies generally outlined in Ref. 2. No expected results for informal assessments are not specified.	100% of all mandated assessments and a goal of 70% of the BMP assessments specified in team or discipline action plans are expected.	Higher level assessments generally reflect the activities at the individual level.
Formal requirements are reviewed periodically by policy. Lower and higher level assessments indicate the effectiveness of responses to findings and observations at this level.	Team and discipline members work findings and observations at the lowest level within the line and take immediate corrective actions where feasible. Significant issues, trends, etc., are communicated through ,e.g., team-discipline, team-line, and other regular meetings.	Individuals are expected to act upon findings and observations. These are generally reflected in the higher level assessments.
Formal assessments are documented by the very nature of the process. Informal assessments may not be documented.	Assessments are documented in team or discipline logbooks or the appropriate database.	There is no formal documentation process.

Summary

The objective of the Laboratory's overall ES&H compliance assessment process is to assure the Laboratory works safely, i.e., that employees, the public and the environment is protected and requirements are met. An assessment philosophy and a process are in place to support this objective.

Over the years the Laboratory has developed its hierarchical compliance assessment process. It emphasizes more ES&H compliance technical details at the lower levels and more management evaluations at the higher levels.

Most of the process has been in place for many years, but a more formal assessment process at the directorate level and other refinements have been introduced since the Laboratory-wide assessment by the DOE Tiger Teams. This formal directorate level assessment process is still evolving.

The new DOE Integrated Safety Management and Oversight initiatives rely heavily upon an effective assessment process. Each level of the Laboratory's hierarchy meets many of the tenants of the DOE Integrated Safety Management initiative and the overall process fulfills one of the five key Functions.

References

- 1) *The Environment, Safety, and Health Program at the Lawrence Livermore National Laboratory*, and its appendices (updated June 1996)
- 2) *Health and Safety Manual* and its Supplements (updated per schedule)
- 3) *Environmental Compliance Manual*, November 1994
- 4) *DefTrack Policies and Procedures Manual*
- 5) *LLNL Training Program Manual*
- 6) *Hazards Control Department Manual*
- 7) DOE/UC Guidance Documentation at: <http://labs.ucop.edu/>
- 8) *Appendix F Annual Report to UC/DOE*

Acknowledgments

I wish to thank several people who contributed information, advice and suggestions for this report. They include but are not limited to Steve Carr and Team 4 for much of the Team information, Susi Jackson and Dave Myers for the Discipline information and Dennis Fisher, Orville Paul and Joyce Ray for advice and editorial suggestions. I appreciate the help provided by these and other staff.

Appendix A: Overview of DOE's ES&H Initiative Integrated Safety Management (ISM)

From: (DRAFT) **DEPARTMENT IMPLEMENTATION PLAN**
(Department of Energy Plan for the Development and Implementation of)
Integrated Safety Management
(Implementation Plan for Board Recommendation 95-2)

Executive Summary

The Department is committed to conducting work efficiently and in a manner that ensures protection of workers, the public and the environment. Over the past three years, the Department has developed and implemented a number of systems that are designed to achieve an acceptable level of safety throughout Departmental operations. These systems are designed to achieve the following results:

- Enhance our ability to plan and execute work, identify the hazards associated with specific operations and activities, and control or eliminate such hazards in an appropriate and cost-effective manner;
- Clarify our expectations for the work to be accomplished and the level of environment, safety and health protection to be established and to do so in a manner that is not overly prescriptive but allows contractors to exercise the best means of meeting these expectations;
- Establish clear roles and responsibilities for protection of environment, safety and health throughout the Department and our contractor corps;
- Shift the focus of attention from "paper requirements" and documentation to a disciplined, analytical and collaborative focus on work planning, hazards analysis and hazards control; and
- Establish analytical bases for setting risk-based management and project priorities.

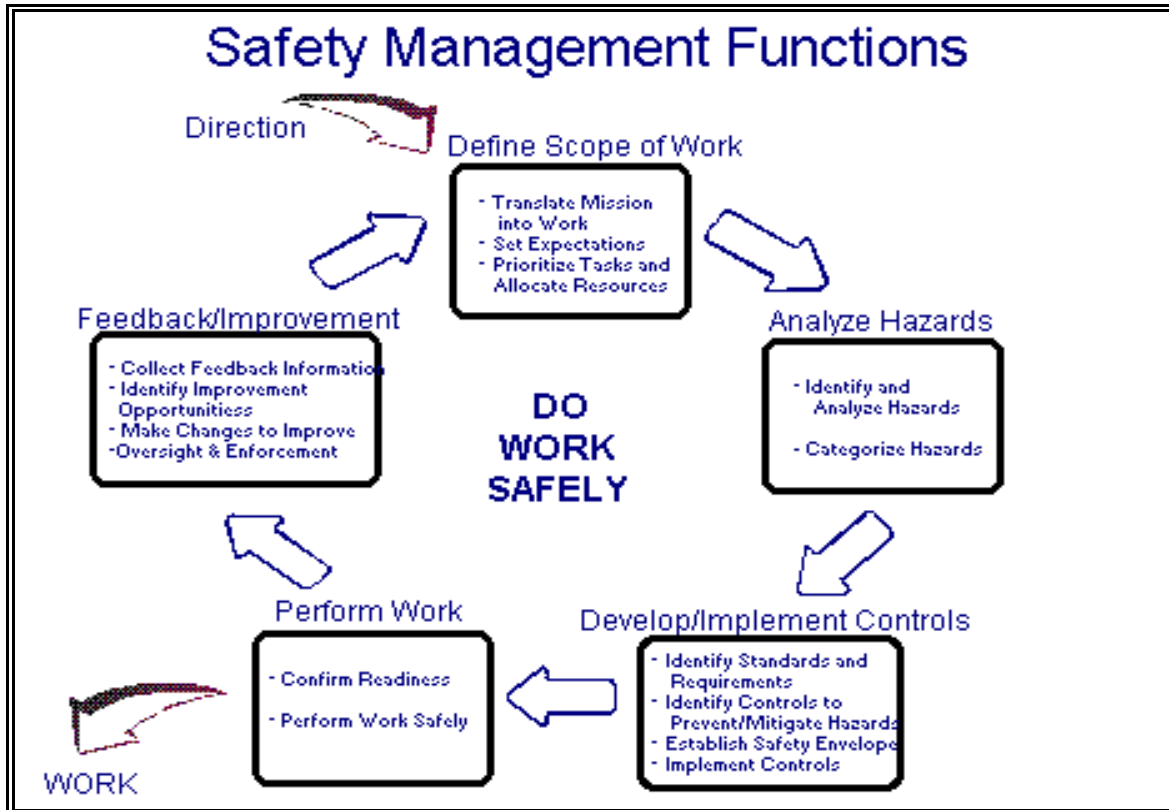
The objective of safety management is for the Department and contractors to systematically integrate safety management into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment. Stated simply, the objective is to: **DO WORK SAFELY.**

Objective of Safety Management

The Department and Contractors systematically integrate safety management into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment.

Safety management activities can be grouped into five core safety management functions:

- 1) define scope of work,
- 2) identify and analyze hazards associated with the work,
- 3) develop and implement hazard controls,
- 4) perform work within controls, and
- 5) provide feedback on adequacy of controls and continuous improvement in defining and planning work.



There are seven underlying principle for a good Integrated Safety Management program as depicted in the following box.

Safety Management - Guiding Principles

1. *Line Management Responsibility for Safety.* Line management is responsible for the protection of the public, the workers, and the environment.
2. *Clear Roles and Responsibilities.* Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels within the Department and its contractors.
3. *Competence Commensurate with Responsibilities.* Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.
4. *Balanced Priorities.* Resources are effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and performed.
5. *Identification of Safety Standards and Requirements.* Before work is performed, the associated hazards are evaluated and an agreed-upon set of safety standards and requirements are established which, if properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.
6. *Hazard Controls Tailored to Work Being Performed.* Administrative and engineering controls to prevent and mitigate hazards are tailored to the hazards and the work being performed.
7. *Operations Authorization.* The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed-upon.

Appendix B: Critical Questions and Answers for Each Block and Level

Answers for most of the blocks in the Laboratory's ES&H compliance assessment hierarchy are straightforward, but for some the variety and nature of the processes make precise answers difficult. Thus, there is considerable variability in the answers.

Where feasible and to give a sense of the magnitude of the activity, numbers are presented in the closing paragraph. Where provided the numbers are conservatively low. They represent only the regular assessments and do not reflect daily operations. The numbers are for the Laboratory or a single directorate. What is used is defined in the text.

Level 7: Individual

Each person has ES&H responsibilities. These are described in Reference 1. In addition each employee's ES&H performance is formally evaluated as part of his or her annual performance review. Regular assessment of ES&H, other than conformance to general policies, is not part of most employees job assignment. Where their job assignment does require such activities, these activities are reflected at higher levels in the hierarchy.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent is to have each employee sufficiently knowledgeable that he or she can protect him or her self, coworkers, the public and the environment. Each employee has the authority to stop work (see Reference 1). To meet this intent, each employee is expected to be aware of general Laboratory ES&H policies and procedures. Training is required of each new employee to provide a base knowledge. Additional training is provided as required by the discipline and/or assignment. For example, mandatory training is specified in Reference 5: LLNL Training Program Manual, and in various Facility and Operations Safety Procedures (FSPs & OSPs).

Q2: Are line managers or staff involved at this level?

Individuals are generally line staff. Line managers provide the guidance and funds to support staff training and oversee employee commitment to ES&H.

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are shown in Reference 1.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

Other than general policies, no specific criteria are provided to individual employees. They receive knowledge of requirements through their specific discipline and assignment training.

- Q5:** Are plans needed to conduct the assessment at this level?
Each employee's performance appraisal includes an assessment of their ES&H performance. Specific plans are required for some assignments.
- Q6:** Are the assessors competent to do the intended assessment?
Competency is the goal of individual required training.
- Q7:** What are the actual versus expected/planned assessment activities?
The higher level assessments generally reflect the activities at the individual level. Good results at higher levels is possible only if individual ES&H performance is good.
- Q8:** Are the findings/observations being reviewed and acted upon?
The higher level assessments generally reflect the activities at the individual level. Employee concerns are acted upon by management and ES&H experts.
- Q9:** Are the results documented?
The higher level assessments generally reflect the activities at the individual level. There is documented evidence of actions taken in response to employee concerns.

Estimating the number of regular ES&H assessments done by a line staff person is not feasible. Since typical line staff have limited training and knowledge of ES&H, the number is likely a few per person.

Level 6: ES&H Experts

ES&H TEAMS IN (WORK) AREAS

ES&H Teams are assigned to support specific directorates, programs, locations and/or activities. These teams develop ES&H Team Action Plans (TAPs) that are tailored to the hazards present for facilities and operations. The Plans generally span the set of all applicable ES&H topics and the assessment frequency may be hazard level dependent.

The ES&H Team Leaders develop the TAPs based on an analysis of Discipline Action Plans (DAPs). DAPs are developed by all the discipline members supporting the Team. The TAP is a collection of routine and ES&H services the Team is to deliver to a program area. Examples of these duties include scheduled ventilation system surveys, surface swipes for radiation

contamination, planned walk-throughs and inspections of facilities etc. Discipline members typically review and initial the log book of the Teams to confirm that these routine duties are being performed.

Q1: What are the scope, intent and expected results of the assessment at this level?

The Team assessment process is intended to find problems early and correct them at the lowest possible level. The purpose is to control and reduce ES&H incidents. The TAPs serve as best management practices criteria for the Teams. The list of topics and the suggested frequency of assessments is contained in the Reference 6: Hazards Control Manual, Section 3.04, Discipline Action Plans/Team Action Plans.

Q2: Are line managers or staff involved at this level?

The line is involved in several ways. The line managers provide the funds to support the Teams. The Team member informs the line staff person in the area if something is found. The responsibility for corrective action falls to the line management.

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are shown in Reference 1.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

The criteria used to develop individual TAPs for each facility/activity are indicated in Reference 6. ES&H technical professionals establish the criteria and scope based on their expert knowledge and their experiences at the Laboratory. The bases for these criteria are, in general, best management practices. The list of ES&H topics addressed are shown in Appendix D.

Q5: Are plans needed to conduct the assessment at this level?

TAPs are developed for most facilities and activities. Many TAP elements have fixed assessment frequencies and the assessment frequency is tailored or graded to the facility/activity for the other elements. The Team members with inputs from the appropriate ES&H professional make this determination. Note: The assessments done at this level are viewed as very cost effective because they are done by well trained staff that live in or frequent the work areas on a daily basis.

Q6: Are the assessors competent to do the intended assessment?

ES&H Team members take an extensive set of training in a broad cross section of ES&H disciplines. The set of training courses required is shown in Appendix E. They are also taught to contact the appropriate environment, safety or health professional when ever an issue arises that is outside of their training or experience. The qualifications of Team 4 (the Team that supports Plant Operations) is also included in Appendix E.

- Q7:** What are the actual versus expected/planned assessment activities?
100% completion is expected for required assessments. However, since the TAPs generally address best management practices that are not required by DOE Directive or laws, assessment completion of 70% or better is a typical goal.
- Q8:** Are the findings/observations being reviewed and acted upon?
Each Team member is expected to work ES&H issues at the lowest reasonable level in the line organization. Thus, immediate corrective action by local line staff and the Team member is the norm. This provides defacto OJT training to the line staff. In some cases line management and/or discipline experts are called for assistance. Three types of regular meetings provide the mechanism to review and discuss multiple and/or unusual ES&H issues: Team, Discipline-Team and Discipline/Team-Line. Significant issues are passed to others via several mechanisms, e.g., Lessons Learned and ES&H Working Group.
- Q9:** Are the results documented?
The results are documented in the Team member's log book or elsewhere. The location of the documentation is also shown in Appendix D. Note: Given the number of topical assessments done across the Laboratory as a result of the TAPs activities and the numerous other normal Team member activities, it is not practical nor reasonable to compile these assessment activities into a database, e.g., DefTrack.

Annually over 100,000 assessments spanning the set of all topical elements is conducted by the four ES&H Teams. Appendix D summarizes the results by Plan element for Plant Operations between January 1995 and September 1996. Similar elements, but with numbers to reflect their hazards, exist for other directorates.

ES&H DISCIPLINE EXPERTS

The discipline experts from the ES&H Organizations participate in a variety of assessment activities. Some of these activities are specified in the Discipline Action Plans (DAPs) and others are contained in separate documents. Some of these assessment activities are performed for the Institution, e.g., fire extinguishers checks, confined space audits, and compliance with 10 CFR 835. Other assessment activities are performed by the ES&H Team safety discipline experts for the specific areas which they support. These discipline experts are also frequently called upon by line staff and managers to provide guidance for unusual situations or concerns. The list of safety discipline self assessment activities is provided in Appendix F.

These experts have dual roles: to provide technical support to their customers and to assure ES&H activities are properly carried out (see Reference 1).

Q1: What are the scope, intent and expected results of the assessment at this level?

The Discipline assessment process is intended to prevent problems and, should they arise, to find them early and correct them. The purpose is to control and reduce ES&H incidents.

Q2: Are line managers or staff involved at this level?

The line is involved in several ways. The line managers provide the funds to support the discipline experts directly through the ES&H Teams or indirectly through overhead funded support. Unless the issue is an Institutional one, the responsibility for action falls to the line management.

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are shown in Reference 1.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

Some of these activities are specified in DAPs and others are contained in separate documents. They are based on DOE Rules, Orders, OSHA regulations, ANSI standards, the LLNL Health and Safety Manual, the Environmental Compliance Manual, and in some cases best management practices. ES&H technical professionals establish the specific criteria and scope based on their expert knowledge and their experiences at LLNL. The list of ES&H topics addressed are shown in Appendix F.

Q5: Are plans needed to conduct the assessment at this level?

The appropriate ES&H professionals determine the assessment needs based on the requirements identified in the response to Q4 and their professional judgment, training and understanding of the hazards at the Laboratory. Note: The assessments done at this level are viewed as highly effective due to the use of a well trained professional staff.

Q6: Are the assessors competent to do the intended assessment?

The Laboratory's ES&H discipline professionals generally have one or more advanced degrees in one or more ES&H disciplines. Most are certified in their profession, have many years of experience and have other qualifications.

Q7: What are the actual versus expected/planned assessment activities?

100% completion is expected for required inspection. However, since the Plans generally address best management practices that are not required

by DOE Directive or laws, assessment completion of 70% or better is the typical goal.

Q8: Are the findings/observations being reviewed and acted upon?

The discipline expert is expected to work ES&H issues at the lowest reasonable level in the line organization. Thus, immediate corrective action by local line staff and the expert is the norm. This provides defacto OJT training to the line staff. Regular meetings, as described for the Teams, provide the mechanism to review and discuss multiple and/or unusual ES&H issues. Significant issues are passed to others via several mechanisms, e.g., Lessons Learned and ES&H Working Group.

Q9: Are the results documented?

The results are documented in various log books, databases or elsewhere depending upon the type of assessment. The location of the documentation is also shown in Appendix F. Note: Due to the number and variety of topical assessments across the Laboratory it is not practical nor reasonable to compile these assessment activities into a database, e.g., DefTrack.

Annually several tens of thousands of discipline assessments spanning the set of all topical elements are conducted by the ES&H Discipline experts. See Attachment F for a summary of some of these assessment activities.

Level 5: Organizational

ORGANIZATIONAL PERMITs, OSPs, FSPs, and REVIEWs

Important to the ES&H assessment process are the reviews required by Laboratory policies and best management practices. Laboratory policies require adherence to the requirements specified in References 2 & 3 and with guidance from ES&H professionals (when new or undocumented guidance is required). Examples of formal reviews include hazards analyses, OSPs, FSPs, SARs, readiness reviews and design reviews. Protocols and criteria are documented for these formal activities. In each case ES&H experts are a part of the process and in most cases the protocol requires their signature in addition to that of the responsible line person.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent of these activities are to assure the four ISM functions, Define Scope of Work, Analyze Hazards, Develop/Implement Controls and Perform Work (see Appendix A) are properly planned and implemented particularly for higher hazard/risk activities. The scope and expectations for these activities are contained in References 2 & 3.

Q2: Are line managers or staff involved at this level?

The reviews are initiated by the line. ES&H experts provide technical support and guidance. Final sign-off of these documents after review is by the line organization.

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are shown in Reference 1, and in Reference 2 for the specific document, e.g., OSPs and FSPs.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

These are specified in References 2 and 3.

Q5: Are plans needed to conduct the assessment at this level?

The requirements are specified in References 2 & 3.

Q6: Are the assessors competent to do the intended assessment?

The policies for implementing the reviews specify who is to participate. This specification assures competent staff are involved in the review process.

Q7: What are the actual versus expected/planned assessment activities?

The activities are specified by policies but not always explicitly measured.

Q8: Are the findings/observations being reviewed and acted upon?

Most are reviewed periodically by policy. For example, OSP/FSP training requirements are to be reviewed prior to an employee beginning work, OSPs are reviewed at least once per year, FSPs are reviewed at least every three years. Lower and higher level assessment findings indicate the effectiveness of these activities.

Q9: Are the results documented?

Yes, by the very nature of the process.

Hazards analyses have been performed for all Laboratory facilities and significant operations. There are about 175 FSPs and 400 OSPs. The number of design reviews, etc. vary by year and are not easily determined.

ORGANIZATIONAL WALK-THROUGHS, MEETINGS and EVALUATIONS

Organizations in each directorate participate in the formal self assessment process defined in reference to Supplement 2.04. Most organizations, depending upon the hazards involved, the detail of their formal self assessment and other factors, conduct informal assessments. These assessments range from daily walk-throughs, regular “tailgate meetings”, to detailed “check lists” of specific functions, for example, waste accumulation areas.

Q1: What are the scope, intent and expected results of the assessment at this level?

Organizational evaluations are wide-ranging. They are intended to foster positive ES&H culture in addition to ensuring the Laboratory's ES&H policies are being appropriately implemented.

Q2: Are line managers or staff involved at this level?

These evaluations are generally initiated by management but may be run by staff and, in some cases, are actually initiated by the staff. For example, an excellent safety process has been developed by craft persons. They have been recognized nationally for their efforts to develop safety culture. Although a long process, it is now showing very positive dividends and many outside organizations are soliciting information on how to apply the techniques within their own organizations.

Q3: Are roles, responsibilities and authorities clear? Except for management initiated evaluations, roles are defined by the group or activity.

Q4: Are there criteria, bases and/or requirements for the assessment activity? The Laboratory policies reflected in References 1 & 2, and best management practices used by others, form the bases for the activities.

Q5: Are plans (including informal ones) needed to conduct the assessment at this level? Plans are not always developed.

Q6: Are the assessors competent to do the intended assessment? This varies by activity.

Q7: What are the actual versus expected/planned assessment activities? This varies by activity.

Q8: Are the findings/observations being reviewed and acted upon? By the very nature of the activity, those directly involved take whatever corrective or improvement actions that are appropriate.

Q9: Are the results documented? Generally measures are developed and tracked as a means of assessing the effectiveness of the activity.

Quantifying the number of these activities that take place around the Laboratory would be very difficult. However, in some cases, the numbers are quite large. For example, Plant Engineering carries out small projects called "Whiz Tags." Annually approximately 40,000 thousand Whiz Tag projects are executed at the Laboratory. These are given descriptive titles which are put on a computer for review by ES&H experts. By perusing the titles potential ES&H problems that may be suggested are further evaluated before,

during or after the work is done. Obviously, after the work is done problems would be found by the line staff or managers or Team or Discipline staff, but the goal of the process is to catch any issues before they become a problem.

Level 4: Directorate

All assessments at and below this level (i.e., Levels 5, 6 & 7) are the responsibility of the directorate, i.e., the responsible associate director. The formal assessment is managed and typically some informal assessments are managed by the directorate office. The formal requirements include but are not limited to:

- Directorate level (Level 4) formal self assessment plan development and implementation. While this formal self assessment is managed by the directorate office, all directorate organizations must be participants.
- Directorate formal self assessment annual report development that includes review and assessment of tracked deficiency data.
- Other activities as specified by the responsible Associate Director and Laboratory policy, e.g., the Assurance Manager that reports to the responsible Associate Director has assessment relevant roles and responsibilities (see Reference 1).

Informal assessments that take place at the directorate office or lower levels depending upon the structure of the directorate. These informal assessments are not required to be part of the formal plan or report but some of these activities may and often are included in the formal report. These and all other informal assessments, never-the-less, are part of the overall assessment process.

Criteria for the assessments at this and subsequent levels are contained in Laboratory policies, manuals, standards and, in the case of new or rapidly changing requirements, the minds of technical professionals who are the "technological gatekeepers" of ES&H criteria. Most of the documentation containing the criteria are contained in References 2 & 3.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent is to conduct and review assessments across the directorate. These assessments are tailored to the unique directorate modes of operation and hazards. The assessments are expected to be sufficiently complete to insure Laboratory policies are met for the entire directorate.

Q2: Are line managers or staff involved at this level?

This activity is lead by line managers. In general, the assurance manager that reports directly to the associate director has the lead responsibility.

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are shown in Reference 1 and in Reference 2, Supplement 2.04. Other roles, responsibilities and authorities may be specified by the associate director.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

The minimum assessment criteria is specified in Reference 2, Supplement 2.04. However, assessments well beyond Supplement 2.04 are expected and are carried out by each directorate through their support and involvement at the lower levels as described earlier.

Q5: Are plans needed to conduct the assessment at this level?

The formal assessment is done to a required plan.

Q6: Are the assessors competent to do the intended assessment?

The assessors are managers who are very familiar with the activities and hazards within the directorate and ES&H technical professionals fully familiar with ES&H requirements.

Q7: What are the actual versus expected/planned assessment activities?

For the formal assessments, these are specified in Reference 2, Supplement 2.04. The actual versus the plan are reviewed periodically by the ARO (Level 3).

Q8: Are the findings/observations being reviewed and acted upon?

This is part of the reporting requirements. Findings are reported in DefTrack per policy. Directorates are to track deficiencies and to review and analyze them for possible trends.

Q9: Are the results documented?

An annual report is required. The content of the report is described in Reference 2, Supplement 2.04.

Level 3: Institutional

ASSURANCE REVIEW OFFICE (ARO) REVIEWS

The ARO is the primary Institutional evaluation and assessment organization for the Laboratory. The roles, responsibilities and authorities of the ARO are specified in Reference 1. Among other things the ARO assesses:

- Directorate level (Level 4) formal self assessment plans and annual reports to assure conformance to the policies as specified in Reference 2.

- Management and ES&H topics. Based on trending information, e.g., DefTrack data, observations, external findings and other sources, ARO does selected vertical and/or horizontal “slices” assessments of management and ES&H subjects.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent is to conduct and review assessments across the Laboratory. These assessments account for the unique directorate modes of operation and hazards but also seek to check both balance and conformance to policies across the Laboratory.

Q2: Are line managers or staff involved at this level?

This activity reports to the Deputy Director for Operations. The ARO works closely with the line assurance managers in carrying out its assessments.

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are shown in Reference 1.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

Criteria used are from a variety of sources including the referenced Laboratory documents and DOE Directives. The ARO frequently uses a list of requirements to guide their assessments.

Q5: Are plans needed to conduct the assessment at this level?

The ARO develops an assessment plan each year.

Q6: Are the assessors competent to do the intended assessment?

The assessors are either previous Laboratory managers or technical staff and/or are ES&H professionals who are very familiar with the activities and hazards within the Laboratory. For special assessments outside experts may be contracted.

Q7: What are the actual versus expected/planned assessment activities?

The ability to complete the planned assessments is the primary measure.

Q8: Are the findings/observations being reviewed and acted upon?

This is part of the process. All findings are provided to the line for action and they are entered into DefTrack.

Q9: Are the results documented?

Assessment findings are documented for the appropriate directorate and Institutional managers.

TRIENNIAL REVIEW OF MANAGEMENT

The Director triennially initiates the review of the Laboratory's (self assessment) management system. This review is conducted by experienced managers from private and/or federally funded organizations. It is the highest level Laboratory managed assessment.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent is to evaluate the Laboratory's self assessment program.

Q2: Are line managers or staff involved at this level?

Line managers provide input for this assessment.

Q3: Are roles, responsibilities and authorities clear?

These are specified as part of the contracting process. (Outsiders are used for this assessment.) The Director owns the review and the Deputy Director for Operations reviews the results for the Director.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

The criteria are based on Laboratory documentation and on the assessors experiences and expertise.

Q5: Are plans needed to conduct the assessment at this level?

These are specified as part of the contracting process.

Q6: Are the assessors competent to do the intended assessment?

This review is conducted by experienced managers from private and/or federally funded organizations.

Q7: What are the actual versus expected/planned assessment activities?

N/A.

Q8: Are the findings/observations being reviewed and acted upon?

This is part of the process. All findings are provided to the line for action.

Q9: Are the results documented?

Assessment results are documented.

Level 2: External

EXTERNAL REGULATORS

External regulators have become an ever increasing part of the whole assessment process. They have been heavily involved in environmental

areas since the 1980's. More recently the DNFSB staff have become active assessors of our nuclear activities.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent is to evaluate the Laboratory's compliance to regulatory standards and requirements. The scope varies over time.

Q2: Are line managers or staff involved at this level?

Line managers directly affected are involved usually with support from the appropriate E, S or H experts.

Q3: Are roles, responsibilities and authorities clear?

N/A.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

Criteria for assessments are generally dictated by statutes and requirements in associated documents. NOTE: It is rare for these assessors to actually use check lists of the criteria. In general, they rely on their experience and expert judgment of the criteria.

Q5: Are plans needed to conduct the assessment at this level?

N/A.

Q6: Are the assessors competent to do the intended assessment?

N/A.

Q7: What are the actual versus expected/planned assessment activities?

N/A.

Q8: Are the findings/observations being reviewed and acted upon?

Findings that are provided to the Laboratory are entered into DefTrack and are acted upon accordingly.

Q9: Are the results documented?

Assessment results are documented.

DEPARTMENT OF ENERGY

These include staff assessments by HQ/PSOs, HQ/EH Office, various OAK program and ES&H offices, and facility representatives.

Q1: What are the scope, intent and expected results of the assessment at this level?

The intent is to evaluate the Laboratory's compliance to DOE standards and requirements. The scope varies.

- Q2:** Are line managers or staff involved at this level?
Line managers directly affected are involved usually with support from the appropriate E, S or H experts.
- Q3:** Are roles, responsibilities and authorities clear?
N/A.
- Q4:** Are there criteria, basis and/or requirements for the assessment activity?
DOE assessors have historically used DOE Directives, Manuals and Guides as the basic criteria since, in general, the criteria in these documents exceed national consensus standards. Some recent assessments have used LLNL implementation plan criteria to conduct assessments.
- Q5:** Are plans needed to conduct the assessment at this level?
N/A.
- Q6:** Are the assessors competent to do the intended assessment?
N/A.
- Q7:** What are the actual versus expected/planned assessment activities?
N/A.
- Q8:** Are the findings/observations being reviewed and acted upon?
All findings are provided to the Laboratory for action. These are entered into DefTrack.
- Q9:** Are the results documented?
Assessment result are documented.

Level 1: UC/DOE Contract

At the highest level, the DOE/UC Contract contains Performance Objectives, Criteria and Measures (POCMs) in Appendix F. These have been mutually developed by DOE/OAK, UC, LBNL and LLNL. Similar POCMs have been developed by DOE/AL and LANL. By agreement these are to be indicators of ES&H performance and are not all inclusive. The Performance Measures (PMs) are assessed each year by LLNL and are reviewed and “graded” by UC and DOE. By definition this is an assessment process where the PMs are evaluated annually.

- Q1:** What are the scope, intent and expected results of the assessment at this level?
The intent of the POCMs is to assess LLNL’s performance and to encourage improvement through the use of a select few performance

measures (PMs). The Contract requires this process and it is part of Appendix F of the Contract.

Q2: Are line managers or staff involved at this level?

UC, DOE and LLNL staff jointly develop the POCMs. The line ES&H Assurance Managers coordinate the LLNL's information and response to the PMs. The majority of the PMs measure performance of line activities (as vs. an ES&H function like environmental).

Q3: Are roles, responsibilities and authorities clear?

The roles, responsibilities and authorities are as defined in documentation jointly agreed to by DOE and UC in the Contract and complementary guidance, Reference 7.

Q4: Are there criteria, basis and/or requirements for the assessment activity?

Criteria are spelled out in DOE and UC agreed to documentation.

Q5: Are plans needed to conduct the assessment at this level?

Plans are agreed to by DOE, UC and the Laboratory.

Q6: Are the assessors competent to do the intended assessment?

Assessors at the Laboratory are generally ES&H technical professionals. The ES&H lead person at UC is a professional who was a regional head of a State environmental regulatory agency.

Q7: What are the actual versus expected/planned assessment activities?

The Laboratory's performance is assessed to determine improvement.

Q8: Are the findings/observations being reviewed and acted upon?

Reviews by DOE and UC are required under the Contract. UC and DOE provides the Laboratory with the results. Reference 8 provides the results and detail.

Q9: Are the results documented?

Reference 8 is the documentation.

There are presently approximately twenty PMs in the Contract.

Appendix C: Sample of Codes from the LLNL DefTrack Code List

Compliance Code	Suggested Priority	Description
E-EC-AQ.02	2	New or existing air pollution abatement devices (e.g., scrubbers, filters, charcoal absorbers) do not have a permit from the applicable air quality management district.
E-EC-NE.02	3	Mitigation measures specified in NEPA document are not implemented (e.g., installation and maintenance of control equipment, endangered species survey, wetlands survey, etc.).
E-EC-PC.04	2	Combustibles are stored within a PCB transformer (>500ppm) enclosure.
E-EC-WQ.01	2	A regulated wastewater generated by LLNL operations or activities is being discharged directly to the storm sewer (e.g., drainage ditch) or to the ground without a permit or written approval from the State Regional Water Quality Control Board.
E-WM-PP.01	3	This facility has not reduced the mixed waste generated in accordance with approved plans.
E-WM-SS.03	2	Dilution is being used as a means of complying with sewer discharge limits.
E-WM-WA.01	2	Incompatible wastes are stored in the same container or tank.
M-ES-GE.02	3	Safety Analysis is not complete or not consistent with current operations.
M-ES-GE.04	3	The NEPA process is not integrated into program planning activities.
M-ES-GE.07	3	A self-assessment program is not implemented, or implementation is inadequate.
M-ES-GE.14	3	ES&H performance is not included in the annual performance appraisal process for managers/employees.
M-ES-PP.02	2	Facility Safety Procedures, Operational Safety Procedures or other work controls are not current, accurate, or are not being followed.
M-ES-TR.01	2	Employees have not received required training.
S-CS-AS.01	1A	Required Criticality Alarm System is not present or not operational.
S-CS-AS.02	2	Criticality Alarm System periodic testing and component checks are not in accordance with the appropriate building safety and/or maintenance

		procedures.
S-CS-PL.01	1B	Glovebox/workstation mass limit is not posted or is not accurate.
S-CS-SL.01	1B	Required Criticality Safety review has not been performed.
S-EP-EE.01	2	Exit door or path is obstructed, restricted or blocked. (minimum width varies by occupancy).
S-EP-SH.01	3	A self-help plan for the facility/area is not available, is not current or is inadequate.
S-EX-EQ.02	1B	Test meters are not approved for use with explosives, or not within calibration dates.
S-EX-GE.01	1B	Unqualified personnel acting as explosives handlers.
S-EX-PL.04	2	Explosives container label is (1) missing; (2) not readable; or (3) missing information.
S-FS-FE.01	3	Area lacks adequate fire extinguishing capability.
S-FS-FP.04	3	Integrity of fire stops compromised (holes in walls, ceiling tiles missing, etc.).
S-IH-AM.03	2	Continuous Air Monitoring Systems (CAMS) are not checked weekly and calibrated at least annually, with documentation.
S-IH-CA.01	1B	A known or suspected human carcinogen or a pathogen is not being handled in accordance with prescribed procedures.
S-IH-CO.01	1B	Confined space access is not controlled according to requirements.
S-IH-CS.03	2	Toxic gas cylinders are not stored in appropriate areas, with cap in place.
S-IH-ER.02	3	Eyewash/shower units are not inspected and flow-tested weekly or per manufacturer's guidance and/or tests are not documented.
S-IH-GE.03	3	Refrigerator is not appropriately labeled and/or contents are not appropriate.
S-IH-HC.01	3	Material Safety Data Sheets (MSDS) are not readily available.
S-IH-TG.03	2	Toxic Gas Cabinet doors/windows do not close automatically.
S-IH-VS.04	2	Required HEPA filters are not present, inadequate, or improperly installed.
S-IS-CA.02	1B	Scaffolding without guardrails is erected and available for use by personnel.
S-IS-CH.02	3	Operators do not possess an LLNL crane operator's license.
S-IS-EL.01	2	Outer circuit breaker panel door or disconnect switch

		cover is not secured to prevent unauthorized access to live parts.
S-IS-FL.02	3	Forklift operator does not possess a forklift operator's license and valid CA driver's license
S-IS-GE.02	1B	Appropriate personnel protective equipment (PPE) is not being used or is being used incorrectly (e.g., safety shoes, safety glasses, hard hats, etc.).
S-IS-GE.06	1B	Lockout/tagout procedure is improperly or inadequately used or implemented.
S-IS-LA.03	1B	Required laser eye wear is missing or not used.
S-IS-LS.03	1B	Ladder (fixed or portable) is not designed and constructed to the required standards (e.g., does not have non-slip base, is painted, etc.). Assign priority #2 if the non compliance from regulatory standards does not present a hazard to personnel (e.g. a fixed ladder on a wall which has only 6 1/2 inch clearance from the wall and not the required 7 inches) .
S-IS-MP.01	1B	Guards are missing, not properly installed or improperly adjusted on equipment or tools (e.g., belts, shafts, gears, fan blades grinders, portable saws, etc.).
S-IS-PR.04	2	Permanent pressure lines are not properly installed or labeled.
S-IS-SP.06	3	Trailer is not adequately seismically secured.
S-IS-ST.04	2	Stair height is not uniform.
S-IS-WW.01	1B	Required guardrails are not provided on roofs, platforms, balconies and landings.
S-RS-DB.03	3	Employees requiring lung and whole body counting have not been tested at the required frequency.
S-RS-DI.01	2	Radiation detection instruments are (1) inappropriate or (2) not available in the area.
S-RS-RC.05	2	Personnel entering area do not have appropriate dosimeter.
S-RS-RP.02	1B	Personnel are using incorrect respirator or using correct respirator incorrectly for work activity.
S-RS-ST.01	2	Radioactive sources or materials inappropriately stored.

Appendix D: Plant Operations ES&H Team Action Plan Topics

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Industrial Hygiene			
IH Problem Identification:	Monthly tours of hazardous areas and annual tours of other facilities to assist in identifying Industrial Hygiene problems as they arise.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
IH Work Practices:	During monthly tours, observe employees performing tasks to assist in identifying Industrial Hygiene work-related issues.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Includes hazardous and non-hazardous areas and/or operations.
Eyewashes & Emergencies Showers:	Monthly checks to verify the proper functioning and maintenance of emergency eyewash and shower units.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
HEPA Filter Surveillance Program:	Assist in the testing of HEPA filters in exhaust ventilation systems as required.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
HEPA Filter Inspection:	Annual visual inspection of in-place HEPA filters and associated housings and ducting.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Spill Clean-up:	Provide guidance and assistance to program and department personnel on spill cleanup safety.	—Health & Safety Technician Logbooks	
Sanitation:	Quarterly tours to identify problems in work areas, food machines, and eating areas.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on the number of areas toured.
Sanitation:	Quarterly tours to identify problems in refrigerators and ovens used for food storage.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on the number of refrigerators and ovens inspected.
Respiratory Protective Equipment:	Monthly inspections to assure that appropriate respirator protection equipment is issued and used effectively minimize exposures to toxic materials.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Workplace Monitoring:	Perform workplace monitoring for chemical contaminants and physical agents as directed by the Industrial Hygienist.	—Health & Safety Technician Logbooks —Analytical Lab Results	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Asbestos Monitoring:	Perform air monitoring during work involving asbestos as directed by the Industrial Hygienist.	—Health & Safety Technician Logbooks —Analytical Lab Results	
Beryllium Monitoring:	Perform periodic monitoring for beryllium as directed by the industrial Hygienist.	—Health & Safety Technician Logbooks —Analytical Lab Results	
Carcinogen Control:	Perform inspections and monitoring of carcinogen handling areas as directed by the Industrial Hygienist.	—Health & Safety Technician Logbooks	
Mercury Monitoring:	Perform monitoring during work involving the handling of mercury as directed by the Industrial Hygienist.	—Health & Safety Technician Logbooks —Analytical Lab Results	
Non- Ionizing Radiation Source Inventory:	Annual inventory of all potentially hazardous sources of non-ionizing radiation.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Radiofrequency, Microwave and Magnetic Field Monitoring:	As needed assist the Industrial Hygienist in monitoring for radiofrequency, microwave, and magnetic fields.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	No radio-frequency, microwave and magnetic field generating equipment in team area.
Confined Space Posting and Entry:	As needed assist in complying with all elements of the LLNL confined space program prior to and during entry into confined spaces.	—Health & Safety Technician Logbooks —Completed Confined Space Entry Permits	
Exhaust Ventilation Measurements:	Evaluate the performance and use of local exhaust ventilation systems.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks —Completed Ventilation Survey Forms	
Noise Monitoring:	As needed assess noise exposure to personnel and evaluate potential noise hazard areas.	—Health & Safety Technician Logbooks	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Chemical Storage:	Quarterly inspections of chemical storage areas to check compliance with Health and Safety Manual requirements.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Operational Checks of Gas Monitoring Systems:	Monthly verification that operational checks of systems are being completed.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Toxic Material Vacuums:	Annually assist with the testing of HEPA filters in toxic material vacuums.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks —HEPA Filter Testing Results Form	
Mercury Vacuums:	Quarterly check to assure the proper functioning of the filter system in mercury vacuum systems.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Instrument Calibration:	Ensure that all Industrial Hygiene instruments are turned-in for calibration as required.	—Team Action Plan Check Sheets —Calibration Records at Industrial Hygiene Instrument Lab	
Lead Inventory and Monitoring:	Locate areas where lead is stored. Perform monitoring during work involving lead as directed by the Industrial Hygienist.	—Health & Safety Technician Logbooks —Analytical Lab Results	
Biohazards:	Perform periodic inspections of areas handling pathogenic or toxigenic organisms as directed by the Industrial Hygienist.		
Heat and Cold Stress:	Perform periodic inspections of operations that have been identified as requiring thermal stress controls as directed by the Industrial Hygienist.	—Health & Safety Technician Logbooks	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Industrial Safety			
General Safety Awareness Tours:	Performed at varying frequencies to ensure that Safety concerns regarding unsafe acts and hazardous conditions are spot checked in order to maintain a safe work place.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Covers all disciplines (Industrial Safety, Industrial Hygiene, Health Physics, Environmental, Fire Protection). Considers 166 Facilities.
Cranes and Hoists:	Quarterly check to help ensure that safety concerns regarding cranes and hoists are being addressed.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on Crane/Hoist Inspection Report Locations.
Lasers:	Quarterly/Semi-annual checks to ensure that safety concerns regarding laser operations are being addressed.		Based on one Laser in PE Facility.
Remote Area Safety	Awareness Tours: Quarterly tours of remote areas (roofs, unoccupied areas, etc.) to spot check for safety concerns.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on 60 Remote Areas.
OSHA Box Checks:	Quarterly checks of OSHA boxes to ensure that complaint forms and the required poster or in place.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Machine Guarding/Safeguarding Surveillance	Semi-annual spot check of machine tools and equipment for proper guarding.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on 32 Shop/Lab Areas.
Pressure/Cryogenics:	Semi-annual spot check of compressed gas cylinders, pressure systems, and cryogenic systems for safety concerns.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Fall Protection:	Semi-annual check of fall protection equipment located in designated storage areas.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on 17 Storage Areas.
Slings and Below-The-Hook Lifting Devices	Semi-annual check of rigging accessories located in designated storage areas.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on 24 Storage Area.
Electrical:	Semi-Annual spot check for unsafe electrical conditions and acts.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Seismic/ Storage:	Semi-annual spot check for safety concerns dealing with the seismic securing of furniture, equipment, and objects stored on shelves.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Eye Protection:	Semi-annual spot check to ensure that proper eye protection requirements and needs are being addressed.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Electrical High Voltage Interlocks:	Semi-annual check of interlock check sheets.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Trailer Stairs, Handrails, and Landings:	Annual check of trailer stairs, handrails, and landings for safety deficiencies.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Portable Ladder Checks:	Annual check of portable ladders located in designated storage areas for safety deficiencies.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	Based on 43 Storage Areas.
Hand and Portable Power Tool Checks:	Annual check of portable tools located in designated storage areas for safety deficiencies.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Program Construction Areas:	As needed tours of program construction areas to spot check for safety deficiencies.	—Health & Safety Technician Logbooks	Based on 50 Tours per month.

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Fire Prevention			
Fire Prevention Tours:	Semi-annual tours of shops/labs and annual tours of other facilities to observe conditions that pose an unacceptable fire risk.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Means of Egress:	Semi-annual tours of shops/labs and annual tours of other facilities to make reasonably certain that building occupants can safely exit facilities during emergencies.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Emergency Call Lists:	Quarterly update of emergency call lists at the Fire Department.	—Team Action Plan Check Sheets —Fire Department for Current Sheets	
Special Information Sheets:	Quarterly update of sheets to ensure that the Fire Department is aware of the location of certain hazardous materials in certain quantities.	—Team Action Plan Check Sheets —Fire Department for Current Sheets	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Health Physics			
Radioactive Material Swipe Surveys:	Performed at varying frequencies to ensure the proper control of contamination.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks —Field Counting Records —Hazards Control Counting Lab Results Form	2,576 Mandated Swipes — — Does not include "As Needed" items.
Radiation Dose Surveys:	Performed at varying frequencies and locations to ensure that radiation areas are properly posted, workers are aware of dose rates, and personnel doses are kept as low as reasonably achievable.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks —Dose Rate Survey Maps	Does not include "As Needed" items.
Air Sampling/Monitoring:	Performed at varying frequencies and locations to monitor for possible airborne radioactivity and provide real-time notification when required.	—Health & Safety Technician Logbooks —Hazards Control Counting Lab Results Form	Does not include "As Needed" items.
Exhaust Air Sampling/Monitoring:	Performed at varying frequencies to monitor for possible airborne radioactive exhausted from designated facilities.		
X-ray Machine Surveys/Interlock Checks/Safety Box Checks:	Performed to assure that all x-ray machines are properly shielded, posted, and operating properly.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks —X-ray Machine Survey Forms	
Temporary Shielding Controls:	Performed to ensure that temporary shielding remains in place to maintain exposures ALARA.		Can not quantify this effort.
Hand and Foot Counter Checks:	Performed to assure operability and reliability of hand and foot counters.	—Health & Safety Technician Logbooks	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Calibration/Q A of Various Radiation Detection Equip.(port- able meters, swipe counters, liquid scintillation counters, radiation area monitors)	Performed to ensure that detection equipment is properly calibrated and functioning properly.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks —Records maintained at Hazards Control Calibration Lab	
Release of Potentially Contaminated Equipment:	Performed to verify that equipment released from an area is not contaminated above the limits specified in 10CFR835.	—Health & Safety Technician Logbooks —Equipment Release Forms	
Sealed Radioactive Source Inventory/Leak Checks:	Performed to verify that all accountable sources are located and to verify the integrity of each source.	—Team Action Plan Check Sheets —Materials Management Inventory Sheets —Hazards Control Counting Lab Results	
Distribution of Bioassay Kits and Extremity Dosimeters:	Performed to ensure that bioassays are received and processed in a timely manner and that extremity dosimetry is available for use as required.	—Team Action Plan Check Sheets —Records maintained at Hazards Control Bioassay Lab	
Records Retention:	Performed to ensure that radiological records required by 10CFR835 are retained.	—Team Action Plan Check Sheets	Can not quantify this effort.
Dumpster and Salvage Bin Monitoring:	Performed to provide a final check to assure that contaminated items have not been placed in non-radioactive waste.	—Health & Safety Technician Logbooks	
Vehicle Surveys:	Performed to ensure any vehicles leaving LLNL are not contaminated above the limits specified in 10CFR835.	—Health & Safety Technician Logbooks	

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Environmental Protection			
Environmental Tour:	Weekly tour of active areas to note changes in operations that may affect the environmental protection program.	—Team Action Plan Check Sheets —Health & Safety Technician Logbooks	
Environmental Incidents:	Assist as a secondary responder to environmental incidents/emergencies.	—Health & Safety Technician Logbooks	

Generic ES&H Support-PO

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
Health & Safety Generic Support			
In addition to above tasks carried out mainly by the H&S Techs., the following generic support is provided by the ES&H professionals assigned to the ES&H Teams:	Provide technical support and guidance.	N/A	N/A
	Assist in the development and review of safety procedures.	•ES&H Team 4 (Jim Vigus) •Baloo Server (HC)	
	Conduct facility inspections.	DefTrack Reports	
	Perform informal facility tours.	Health & Safety Technician Logbooks	
	Perform technical analysis to identify and resolve safety issues.	Various (Safety Procedures, Hazards Assessments, Memos, Logbooks, etc.)	These are a daily routine function of the ES&H Team and therefore are not quantifiable efforts.
	•Make recommendations for engineered safety features, administrative controls, and use of personal protective equipment. •Provide safety related training. Provide technical support at emergency scenes.	Various (Safety Procedures, Hazards Assessments, Memos, Logbooks, etc.) Class Sign-in Sheets N/A	These are a daily routine function of the ES&H Team and therefore are not quantifiable efforts.

ROUTINE	DESCRIPTION	DOCUMENTATION	COMMENTS
	Perform accident/incident analysis.	Incident Analysis (IA) Reports Supervisor Accident Analysis Reports (SAAR)	551 SAARs 2 IAs
	Review engineering plans and specifications.	•ES&H Team 4 Design Review Associate (Jim Forte)	

Appendix E: Generic ES&H Team Training Requirements and Team 4 Qualifications

Team Technician Training Requirements

HS0001	New Employee Orientation
HS0003	HC New Employee Orientation
EM5310	SARA/OSHA
EP0006	Hazardous Waste Management
HS0005	ES&H for Managers
HS0032	Preparing an OSP
HS1620	First Aid
HS1640	CPR
HS1670	CBT Fire Extinguishers
HS2016	Explosives Safety
HS3100	Criticality Safety
HS4052	HHC for Supervisors of Chemical Labs
HS4150	Confined Space Entry
HS4240	CBT Chemical Safety
HS4246	CBT Laboratory Safety
HS4360	Noise
HS4370	Non-ionizing Radiation
HS4610	Air Purifying Respirators
HS4630	SCBA Training
HS5030	Pressure Orientation
HS5200	CBT Laser Safety
HS5210	Capacitor Safety
HS5220	Electrical Hazard Awareness
HS5300	Back Care Workshop
HS5500	Seismic Safety Training
HS5620	CBT Fork Truck Safety
HS5690	Crane Safety
HS6010	CBT Contamination Controls
HS6070	X-ray Safety
HS6300	CBT Contamination Control
HS6340	Donning and Doffing
HS6390	Glovebox Safety
HS6510	Release Surveys - Uranium

In addition to taking all of the above , the Health and Safety Technicians must complete the following specific training:

- **Basic Technician Training:** This is a series of on-the-job briefings performed by senior technicians or a lead ES&H technology expert. Briefings cover all ES&H disciplines.

- **Advanced Technician Training:** This is a series of specialized courses developed and taught by ES&H professionals from all disciplines.
- **RadCon Technician Training:** These include the following:
 - Core Academic Series
 - Site Specific Academic Series
 - Job Performance Measures
- Off-Shift Training
- Specialized training for some job assignments, such as NEST/ARG/RAP, plutonium facility, etc.

Other team members are required to take courses specific to their discipline.

ES&H Team 4 Qualification Summary

Position	Education	Certification	Work Experience
Team Leader	MS in Safety	¹ CSP, ² NRPT	6 Years Naval Nuclear Power 16 Years LLNL-ES&H
Deputy Team Leader	MS in Safety	CSP	7 Years Naval Nuclear Power 17 Years Commercial Nuclear Power 8 Years LLNL-ES&H
Lead Technician	2 Years College — Physics/Science	CSP, NRPT	6 Years Naval Nuclear Power 9 Years Commercial Nuclear Power 13 Years LLNL-ES&H
Technician A	BS in Biology	—	2 Years Naval Aviation Electronics 12 Years LLNL-ES&H
Technician B	AS in Radiation Technology	CSP, NRPT	20 Years LLNL-ES&H
Technician C	AS in Industrial Production Safety	—	20 Years Naval Safety Officer 4 years LLNL-ES&H
Technician D	AS in Radiation Technology UC Davis Certificate—Fire Protection	³ ASP, NRPT ⁴ CFPS, HAZMAT Tech Asbestos Abatement Food Sanitation	8 Years Naval Nuclear Power 2 Years Commercial Nuclear Power 5 Years LLNL-ES&H
Technician E	BS in Business AA Civil Engineering AA Radiation Technology	Asbestos Abatement	4 Years Army- Nuclear Weapons 3 Years LLNL-ES&H

Technician F	MS in Public Health	—	6 Years Naval Nuclear Power 17 Years LLNL-ES&H
Technician G	BS in Biology	CSP, ⁵ OHST	18 Years LLNL-ES&H
Technician H	Certificate in Radiation Technology	—	10 Years Rocky Flats-ES&H 10 Years LLNL-ES&H
Technician I	—	—	6 Years Naval Nuclear Power 12 Years LLNL-ES&H
Fire Protection Engineer A	BS in Fire Science	—	32 Years Related Experience
Health Physicist A	MS in Health Physics	—	12 Years Related Experience
Health Physicist B	MS in Health Physics	NRPT	20 Years Related Experience
Industrial Hygienist A	MS in Public Health	⁶ CIH	18 Years Related Experience
Industrial Hygienist B	BS in Environmental Science	CIH	16 Years Related Experience
Industrial Hygienist C	MS in Public Health	CIH	10 Years Related Experience
Industrial Safety Engineer	MS in Safety	CSP, ⁷ CHCM	20 Years Related Experience

¹CSP (Certified Safety Professional)

²NRPT (National Registry of Radiation Protection Technologists)

³ASP (Associate Safety Professional)

⁴CFPS (Certified Fire Protection Specialists)

⁵OHST (Occupational Health & Safety Technologist)

⁶CIH (Certified Industrial Hygienist)

⁷CHCM (Certified Hazards Control Manager)

Appendix F: Plant Operations Health and Safety Discipline Action Plan Topics and Generic Environmental Discipline Action Plans

Health and Safety Discipline Action Plans for Plant Operations

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMEN- TATION	COMMENTS
Industrial Hygiene				
Confined Space Program Audits	Perform audits of confined space entry practices based on random or targeted activities.	Biannual	Written report.	This is performed institutionally for the Laboratory.
Review of FSPs and OSPs	All FSPs and OSPs are reviewed by each discipline, as appropriate, when they are initially prepared.	FSPs are reviewed every 3 years and OSPs are reviewed every year.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	
Review of Safety Documents, PSARs, SOPs, Design Reviews, PHAs	These documents are reviewed by each discipline, as appropriate.	Performed as required.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	
Building Inspections	Formal building inspections conducted in accordance with Program Self-assessment Plans.	Performed as required.	Findings entered into Def Track system.	
IH work Practice Reviews	Perform routine and targeted work area walk-throughs to identify potential IH-related problems.	Performed as required.	Written report.	

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMENTATION	COMMENTS
Workplace monitoring for chemical & physical agents. This includes, but is not limited to, asbestos, lead, carcinogens, beryllium, mercury, metals, other organic and inorganic chemicals, noise, heat stress, cold stress, non-ionizing radiation and biohazards.	Collect air and surface samples as necessary to evaluate potential employee exposures and to characterize potentially contaminated areas and surfaces.	Performed as required.	Written report.	In 1995, there were 800 monitoring operations conducted. This is typical of the annual monitoring activity.
Indoor Environmental Quality Reviews	Investigate indoor environmental conditions in response to occupant concerns or otherwise identified problems.	Performed as required.	Written report.	There are typically a few of these operations performed per year.
Inspection of Sanitation in Cafeterias	Inspect food handling and processing in cafeterias.	Performed semi-annually.	Written report.	
Chemical Hygiene Audit	Verify implementation of the Chemical Hygiene Plan.	Performed annually.	Written report.	This is performed institutionally for the Laboratory.
Water Quality Monitoring	LLNL monitors its drinking water for physical, chemical, and biological contaminants.	Monthly.	Written results.	Test program and results are reviewed by the industrial hygienist.
Respirator Use Audit	Audit the respirator issue and maintenance program. Audit compliance with respirator use requirements in the field.	Performed annually.	Written report.	This is performed institutionally for the Laboratory.

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMENTATION	COMMENTS
Industrial Safety				
Building Inspections	Formal building inspections conducted in accordance with Program Self-assessment Plans.	Performed as required.	Findings entered into Def Track system.	
Institutional Committees	Serve as members on various ES&H related committees including the Ergonomics Task Force, PE ES&H Committee and Traffic Safety Committee, Electrical Safety Advisory Board.	Periodically to assess the ES&H issues related to the various topic areas. Specifically they review the injury/illness/incident data related to each of the topic areas.	Activities are documented in the meeting minutes.	
Review of FSPs and OSPs	All FSPs and OSPs are reviewed by each discipline, as appropriate, when they are initially prepared.	FSPs are reviewed every 3 years and OSPs are reviewed every year.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	Every operation that requires one must have a current FSP or OSP.
Review of Safety Documents, PSARs, SOPs, Design Reviews, PHAs	These documents are reviewed by each discipline.	Performed as required.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	
Proactive Intervention	Participate in special projects to assess health & safety hazards and identify recommended controls, i.e., custodian ergonomic study and training video.	Performed as required.	The custodian ergonomic study was documented in a report and was recently presented at the National Safety Council meeting.	
Product Safety Alerts	Develop institutional product safety alerts/recalls as deemed appropriate, i.e., temporary power taps, office chairs, Swingline staplers, etc.	Issued as required.	The product safety alerts are listed on the Hazards Control Department's home page.	This is performed institutionally for the Laboratory.

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMENTATION	COMMENTS
Safety Performance Feedback	Provide directorates/programs with injury/illness related statistics, trend analysis and recommended controls.	Provide reports as requested by programs.	Review the injury/illness/incident data related to each of the topic areas. The documentation is maintained by the team & provided to the specific customer.	A statistical summary of accident/injury data is broken down in appropriate organization units.

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMENTATION	COMMENTS
Fire Protection				
Fire Protection Building Assessments (FHAs)	Performed at varying frequencies depending on hazard category and monetary value of building.	Compl. in accordance with individual ES&H Team schedules.	Fire Haz. Analysis Rep. distributed to Facility Mgr Original analysis maintained by Fire Protection Tech.Ldr. Electronic copy kept on H&S Server.	Required by DOE 5480.7A
Building Inspections	Formal building inspections conducted in accordance with Program Self-assessment Plans.	Performed as required	Findings entered into Def Track system.	
Review of FSPs and OSPs	All FSPs and OSPs are reviewed by each discipline, as appropriate, when they are initially prepared. FSPs are reviewed every 3 years and OSPs are reviewed every year.	Performed as required.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	Every operation that requires one has a current FSP or OSP.
Review of Safety Documents, PSARs, SOPs, Design Reviews, PHAs	These documents are reviewed by each discipline, as appropriate.	Performed as required.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMENTATION	COMMENTS
Fire Sprinkler Systems	The riser control valves and riser assemblies are inspected.	Monthly.	The records are maintained by the Emergency Management Division.	This is performed institutionally for the Laboratory.
Fire Sprinkler Systems	The alarm portion of the system is tested.	Quarterly.	The records are maintained by the Emergency Management Division.	This is performed institutionally for the Lab. There are currently 182 fire hydrants on site.
Fire Hydrant Test	A physical inspection is performed and a water supply test is conducted. Preventive maintenance is performed.	Annually (when permitted).	The records are maintained by the Emergency Management Division.	This is performed institutionally for the Laboratory.
Fire Extinguisher Inspections	Fire extinguishers are inspected monthly and serviced annually.	Monthly/ Annually..	The records are maintained by the Emergency Management Division.	This is performed institutionally for the Lab. There are 3485 fire extinguishers currently on site
Emergency Lighting	A 30 second test of the emergency lighting is performed.	Monthly.	The records are maintained by the Emergency Management Division.	This is performed institutionally for the Lab. There are 235 emergency lighting systems on site.
Water Supply Valves	Critical water supply valves on LLNL water mains are inspected and verified open.	Quarterly.	The records are maintained by the Emergency Management Division.	This is performed institutionally for the Lab. There are approximately 100 water supply valves.

ROUTINE	DESCRIPTION	FREQUENCY	DOCUMENTATION	COMMENTS
Health Physics				
Compliance with 10 CFR 835	Every 3 years a compliance assessment of the institutional and facility specific requirements in 10 CFR 835 is performed in the 70 nuclear and radiological facilities.	Per schedule	The assessments are documented in reports which are submitted to assurance managers.	A special assessment was completed during 1996 to determine the radiation worker training status on a site wide basis.
ALARA Reports	Radiation dose reports are provided to employees and their supervisors where formal ALARA goals are established.	These reports are provided quarterly to employees and their supervisors who are likely to receive more than 100 mrem/y.	Reports are in graph form. The graphs include the ALARA goals and the cumulative doses for the whole-body and the hand.	
Review of FSPs and OSPs	All FSPs and OSPs are reviewed by each discipline, as appropriate, when they are initially prepared. FSPs are reviewed every 3 years and OSPs are reviewed every year.	Performed as required.		Every operation that requires one has a current FSP or OSP.
Review of Safety Docs. PSARs, SOPs, Design Reviews, PHAs	These documents are reviewed by each discipline, as appropriate.	Performed as required.	The documentation of the review comments is maintained in the ES&H Team 4 Office.	
Hazards Assessments	A Hazards Assessment is performed for radiological concerns if there isn't already one for industrial hygiene issues and there is not an OSP.	Performed as required.	The documentation is maintained by the ES&H Team Health Physicist.	

Generic Environmental Discipline Action Plans

ROUTINE	DESCRIPTION	FRE-QUENCY	DOCUMENTATION	COMMENTS
Specific Environmental Support				
Wastes (Hazardous, Radioactive & Mixed)				
WAA Walk-Throughs	Checks of the WAAs to assure that the WAAs inspections are conducted and documented	Bi-weekly	Summaries to HWM Techs and Program WAA Operators	Most if not all observations are corrected during the walk-through
HWM Audits	Audit of HWM facilities at the Main Site and Site 300 for permit compliance	Monthly	Summaries of these audits go to EPD's management	Findings tracked by HWM - Corrections are also made during the walk throughs
Waste Certification Surveillance	Performs surveillance's of all LLW, TRU and Mixed waste operations for compliance with procedures and documentation.	As required	Findings are documented on Non conformance and Corrective Action Forms (NCAR) and sent to the approp. facility mgr.	
WAA Inventory Reviews	Inspects and verifies the inventory of all Waste Accumulation Areas (WAAs) weekly	Weekly	Inspections verify that documentation turned in to HWMD corresponds with the actual waste in a WAA	
Annual review of waste minimization & Pollution Prevention Plan	ORAD compares progress towards the goals that have set for programs and describe what projects may be required to meet these goals.	Completed Annually	Annual Report	The Programs participate in this review, which was updated during the last year.
WAA Contingency Plans	Plans are reviewed for changes and updated when necessary	Annually	WAA Contingency Plans - updates are submitted to the appropriate emergency response agencies	Programs participate in this review.
WAA Closure Reports	Oversight and verification of WAA closure process by EOG and subject matter expert	As required	Memos prepared documenting closure steps and subject matter expert review	Programs participate with ORAD to review and update

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
Annual review & update of Medical waste permit	Annual renewal of registration and permit as well as update to medical waste management plan	Annual	Annual permit renewal documentation and updated plans	
RCRA Permit application	Assess operations for activities requiring permit, prepare application and negotiate operational parameters	As required	Permit application and supporting documentation, e.g., health risk assessment	Subject matter experts work closely with Program to document compliant design and operations
Interim status modification requests	Assess changes in permitted operations to determine required level of public and regulatory review	As required	Interim status modification request	Subject matter experts work closely with Program to document compliant design and operations
Annual review of PCB usage	Assess and prepare report on use and disposal of TSCA regulated items	Annual		Subject matter expert works closely with HWM and PE to review and document PCB equipment status
Pre and Post regulatory inspection review (EPA, DTSC)	Prepare for and follow up on action items identified in association with external regulatory agency inspections	As required	guidance memos, agency correspondence	Subject matter experts work closely with facility operator to assess and demonstrate compliant design and operations
Treatability study requests	Assess proposed experiments to determine eligibility, prepare necessary regulatory required documents and annual reports of past and proposed activity	As required	Treatability study notifications, annual report, recordkeeping	Subject matter experts work closely with Program to document compliant design and operations
Air				
Annual review of air permits and review of compliance	All permitted sources review the status of the operating needs of the permit and determine future need	Completed annually	Annual permit application and inspections by regulatory agencies.	Programs participate with ORAD in these reviews

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
Air Particulate Sampling	High-volume air samplers operate both on-site and off-site to measure radionuclide particulates and beryllium.	Weekly	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every three years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environmental Report.	
Air Tritium Sampling	Silica gel samplers operate both on-site and off-site to measure tritiated water vapor in the air.	Biweekly	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every three years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environmental Report.	
Air Effluent Monitoring	Continuous stack monitoring is performed at nine facilities (over 100 emission points). Both particulates and tritium are measured. Samples are submitted on a weekly or biweekly schedule depending on source.	Weekly/ biweekly	Monitoring network assessed each year as part of Envir. Monitoring Plan review and every 3 years as part of EMP revision (with technical assessments). Also assessed annually as part of NESHAPs annual reporting requirements. Data reported annually in Annual Site Environmental Report (SAER) and NESHAPs annual report to EPA and DOE.	

ROUTINE	DESCRIPTION	FREQ.	DOCUMENTATION	COMMENTS
Periodic Confirmatory Meas.	Confirmatory measurements at unmonitored emission points confirm that non-monitoring methods used to estimate potential emissions are conservative.	Periodic	Data are reported annually in the NESHAPs annual report to EPA and DOE.	
Pre and Post regulatory agency inspection review (EPA, BAAQMD, SJVUAPCD)	Prepare for and follow up on action items identified in association with external regulatory agency inspections	As required	guidance memos, agency correspondence	Subject matter experts work closely with facility operator to assess and demonstrate compliant design and operations

Chemical Management				
Chem Track inventory	Update chemical container storage locations and owners site-wide	Annual-current inventory began 11/11	ChemTrack database and inventory records.	
Inventory reconciliation	ChemTrack personnel and programs account for inventory discrepancies, identify deficiencies and areas of improving inventory effectiveness.	Annual-In progress	Reconciliation templates, database records, questionnaire, memos, and QuickMail records	
Hotline Response/ Customer Service/ Chemical Purchase Notifications	Respond to requests to inventory chemicals and prepare reports; provide general information regarding related requirements. Process chemical purchase notifications and forward messages to responsible organizations (i.e. Receiving, Permits and Regulatory Affairs, Hazards Control, etc.)	On-going	Hotline response records/logbook.	
Training for new hires, Technical Release Representatives (TRRs) and buyers	Provide general orientation on chemical inventory process and training for TRRs and buyers on purchase procedures for ES&H controlled items, including chemicals.	On-going	Training records/presentation materials	

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
Soil Management				
Preconstruction Site Evaluations	Sample and make recommendations for the management of soils prior to construction projects	As required	Soil and concrete/asphalt disposition memos submitted to Plant Engineering Project Managers who are responsible for managing the material.	
Soil Surveillance Monitoring	Soils and sediments are collected annually both on- and off-site for assessment of radionuclides, metals, and organic constituents.	Annually	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every 3 years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environ.Report.	
Water (surface, sewer, etc.)				
Discharges to sewer & retention tank management	Sampling, review and approval of discharges to sanitary sewer	As required	RSDR	
Site 300 ground water monitoring	Sampling and review of ground water for the purposes of compliance with various permitting requirements and surveillance monitoring.	Ongoing	Compliance monitoring data reported in quarterly monitoring reports to the regional water board. All monitoring and impacts are documented in the Site Annual Environmental Report (SAER)	
Sewer Monitoring	Daily monitoring of LLNL's sewer outfall for radioactivity, metals	Ongoing	Quarterly, Annual and SAER	
Storm Water Pollution Prevention	Certification of compliance with best management practices	Annually	Annual report with certifications from the various Directorates	This program heavily involves participation from the programs

ROUTINE	DESCRIPTION	FRE-QUENCY	DOCUMENTATION	COMMENTS
Ground water & surface water discharge permit mgmt.				
Drainage Retention Basin	Long-term biological monitoring and maintenance program with compliance monitoring required by the water board.	On going (weekly, monthly, quarterly, semi-annually and annual requirements	Reports submitted quarterly to the regional water board and reported annually in the SAER	
Storm Water Run-off	Self-monitoring of surface run-off during rain events, effluent sampling, wet and dry season observations	On going	Data reported in the SAER annually and annually to the appropriate regional water quality control board	This is a Main Site and Site 300 activity.
Other water discharge monitoring	Monitoring (sampling and analysis) of numerous activities at both the main site and site 300	On going	Reported in various required quarterly and annual reports to the regional water boards and the annual SAER	This includes cooling towers at site 300 and other sources at both sites.
Rain water discharges to sanitary sewer	Sampling, review and discharge of rain water to the sanitary sewer	After each rain event	Logs	
LWRP Application for the sanitary sewer	Review of all sewer discharges to update the LWRP permit application	Annually	Permit Application	
Regulated tank contingency plans & operation plans	Review contingency plans and operation plan for adequacy and for incorporation of any operational changes	Annually	Revised Plans	

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
Other Environ- mental				
Meteoro- logical Sampling	Wind speed, wind direction and air temperature are collected continuously from multiple levels at Livermore site and Site 300 meteorological towers. Relative humidity, solar radiation, rainfall, and barometric pressure are also collected.	15-minute averages	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every 3 years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environmental Report. Inspections, calibrations and audits of the tower equipment is performed semi-annually.	
Foodstuff sampling	Wine samples are collected and analyzed for tritium content. Livermore Valley wines are compared to those produced in Europe and non-Livermore Valley areas of California.	Annually	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every 3 years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environmental Report.	
Vegetation Sampling	Vegetation samples are collected both on-site and off-site and analyzed for tritium content.	Quarterly	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every 3 years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environmental Report.	

ROUTINE	DESCRIPTION	FRE-QUENCY	DOCUMENTATION	COMMENTS
Direct Radiation Monitoring	Direct gamma radiation measurements are collected both on-site and off-site using thermoluminescent dosimeters (TLDs).	Quarterly	Monitoring network assessed each year as part of Environmental Monitoring Plan review and every 3 years as part of EMP revision (with technical assessments). Data reported annually in Annual Site Environmental Report.	
Risk/Dose Assessment Modeling	Modeling to support experimental and operational planning.	As needed	Results published in pertinent publications depending on particular rqmts.	
NESHAPs Dose Assessments	Provide program guidance and computer modeling, radionuclide inventories, monitoring, assessments, reporting, and regulatory interactions in connection with radiological NESHAPs requirements.	Annually	Data and compliance status reported annually in NESHAPs annual report to EPA and in the SAER.	

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
NEPA and CEQA Reviews	EEG analysts review proposed LLNL projects in the planning phase, to insure proper application of the DOE NEPA process and the UC CEQA review process.	Ongoing daily	Most commonly prepared NEPA documents include Environmental Assessments (EAs), Findings of No Significant Impact (FONSIs), Categorical Exclusions (CXs), Guidance Requests Responses (GRRs), and Records of Review (RORs). Occasionally, an Environmental Impact Statement (EIS), Record of Decision (ROD), and Mitigation Action Plan are prepared . Most commonly prepared CEQA documents include Initial Studies, Categorical Exemptions, and Negative Declarations. Environmental Impact Reports and Addenda have also occasionally been prepared.	NEPA/CEQA analysts annually review approx. 2000 Directorate/ Program Project proposals and prepare analysis documents on approx. 250 per year. In addition to client interviews/area visits, documents reviewed by analysts to provide proposal background inf. include: GPP & Line Item proposals, Draft Findings and Determinations, S-300 "Excavation" Permits, Draft CRADAs, Work-for-Others Requests, LDRD project list, Draft SAD's, SARs, FSPs, and OSPs, Plant Engineering Form-1s and Job Orders, and Certain procurement requests.
Pre- Ground Disturbance Natural and Cultural Resource Surveys	Staff Wildlife Ecologist and Archaeologist review project proposal documentation and inspect/survey the locations of the proposed projects for compliance with the Endangered Species Act, National Historic Preservation Act, and a number of other Federal Acts, DOE Regulations, CEQA, and Federal Executive Orders.	Ongoing daily	Project Survey Reports, Memoranda of Agreement with State and Federal Resource Agencies, special studies, field survey notes, and memoranda to files (as well as informal briefings to managers and Project Officers).	Several hundred project proposals reviewed annually; approx. 100 formal survey reports prepared annually.

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
Generic Environ- mental Support				
The following generic support is provided by Environmental professionals assigned to the ES&H Teams	Provide technical support and guidance as required.	On going	N/A	Activities conducted by the E-Teams are documented in the bi-weekly minutes of meetings. Major actions are tracked in a Team Log.
	Assist in the development and review of safety procedures.	Participa- tion is determined by the Team Ldr.	ES&H Teams (all) Baloo Server (HC)	

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
	Conduct facility inspections.	Compl. as Requested by the Team Ldrs. (EOG Analyst have the lead responsibility for this action, but often request support from environmental subject matter experts)	DefTrack Reports or documentation (memo) of no findings to the Team Leaders	The following is a general list of items reviewed prior to conducting building inspections, depending on the analysts' knowledge of the particular facility and operations: NEPA Review documentation FSPs/OSPs Discipline Action Plans (DAPs) List of permitted equipment (e.g., air permits) Operator logbooks Previous inspection results Chem Track inventory records Retention Tank inf. (e.g., All Tanks report, inspection records) Categorical processes WAA documents (e.g., weekly inspection checklists, contingency plans, bi-weekly walk-through summaries) SPCC plans Process Knowledge Evaluation (PKE) forms for rad waste RMMA list
	Perform informal facility tours.	Compl. as Requested.	EPD Environmental Support Team meeting minutes/ log books, memos, etc.	
	Perform technical analysis to identify and resolve environmental concerns	Compl. as Required.	Various (e.g. waste characterization memos to generators)/ not always documented/NEPA review results may be documented in a NEPA review document.	These is a daily routine function of the ES&H Team and therefore are not quantifiable efforts.

ROUTINE	DESCRIPTION	FRE- QUENCY	DOCUMENTATION	COMMENTS
	Review engineering plans and specifications.	Compl. as Required.	ES&H Team Design Review- Comments provided to Plant Engineering Project Managers who are responsible for compliance with requirements.	
	Participate in accident/incident analysis.	Compl. as Requested.	Incident Analysis (IA) Reports Supervisor Accident Analysis Reports (SAAR)	
Environmental Duty Officer	Coordinates the overall LLNL emergency response system to provide environmental support to the Lab during an emergency. The EDO takes the necessary action in the following categories: incident evaluation, marshaling resources, containment, cleanup/disposal, sampling and notification/reporting determinations.	As Required	Logs all incidents into the EDO log book and is responsible to write the environmental incident report for all significant incidents.	24 hour on-call duty officer for the laboratory
Provide Regulatory Guidance	Provide to the programs and the Teams guidance on compliance with the various environmental regulations	On going efforts by EPD subject matter experts and EOG analysts	Varies (memos, verbal, and team minute notes)	Electronic and hard copy access to Federal Register summaries, laws, regulations and other environmental newsletters through TID librarian to subject matter experts